THREE ESSAYS ON POLITICIANS' BEHAVIORS

By

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To My Wife, Hyon Song

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Abstract of Dissertation Presented to the Graduate School of the University of Florida in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

THREE ESSAYS ON POLITICIANS' BEHAVIORS

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The purpose of this dissertation is to solve the controversies over the interpretation of politicians' apparent ideological voting. Ideological voting has been regarded as either political shirking or political investment in many cross-sectional studies. In this dissertation, senatorial ideological voting is analyzed from two different angles: by observing the interaction between constituencies and ideological politicians and by observing the degree of ideological voting consumption of retiring politicians. The empirical results provided some evidence that ideological voting is shirking: retiring senators consumed more ideological voting but the winners and losers in elections showed no difference in consuming ideological voting. The ambiguous results may be due to the improper

use of the median voter's characteristics in the empirical work. A senator would serve his supporters, not the median voter of his state. Characteristics of senators' electoral coalitions were derived and used to test if they would better explain senators' voting, as measured by their ideological rankings. I showed that interstate variance and intrastate variance of ideological ranking were better explained by the coalitions' characteristics, but campaign contributions and party difference were the major causes of why they behaved differently.

CHAPTER 1
INTRODUCTION

In 1979, Kau and Rubin studied what would be the major determinant of the passage of a law in Congress. They had three testable hypotheses on politicians' decision-making in the congressional voting. The first one was Stigler and Peltzman's special interest group theory: laws are passed because of the rent-seeking behavior of politicians and special interest groups.[1] The second one was Buchanan and Tullock's theory of logrolling: laws are passed because of vote trading among legislators.[2] The third one was the positive theory of ideology: laws are passed because of legislators' personal beliefs.[3]

Kau and Rubin applied the logit analysis to 26 roll call votes selected from 1974 to see which factor was significant in the passage of the laws. The dependent

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[1]Special interest groups provide electoral and financial support to politicians in exchange for favorable legislation.

[2]In other words, Congressman A, who is more or less indifferent to Bill X, will vote for that bill in return for the vote of Congressman B on Bill Y, which is important to A.

[3]The positive theory of ideology was not documented as a formal theory. But politicians' ideology was frequently found to be a significant explanatory variable in previous empirical works (Silberman and Durden, 1976; Kau and Rubin, 1979).

variable was a binary choice dummy of yes and no, and the explanatory variables were some economic and demographic characteristic variables of the legislators' electoral districts and a measure of the legislators' ideology.[4] Kau and Rubin wanted the characteristics of the representatives' constituency to be the only significant variables, but they found the ideology measure was the most significant one in explaining the passage of the laws.

Kau and Rubin's finding has drawn sizable attention from economists. There has been considerable debate over whether this finding actually reflects political shirking. Some believe this finding to be the result of misspecification.

Peltzman (1984) argued that the significance of ideology could be due to omitted economic variables. With a large sample of votes (331 roll call votes in 1979 and 1980) he found that politicians' ideology was not significant on economic issues such as wealth redistribution but was significant on social issues such as abortion and school prayer. Nelson and Silberberg (1987) got a similar result from senators' votes on defense issues. Peltzman and Nelson and Silberberg interpreted their findings in terms of constituencies' monitoring ability. That is, when politicians' behaviors were closely monitored, personal

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[4]Their measure of ideology was the residual of a regression of ADA ranking on some independent variables.

ideology played no role, but when their behaviors were not closely monitored, personal ideology began to play an important role in legislative decision-making. Therefore, they concluded that politicians' ideological voting behavior was political shirking and that it was consumed by the law of demand.

On the other hand, Kalt and Zupan (1984) studied a narrowly defined economic issue (the Surface Mining Control and Reclamation Act) and found ideological voting to be a significant factor. Therefore, even in specific economic bills, legislators could consume their own ideology at the expense of constituencies' cost. Recently, Kalt and Zupan (1987) found that politicians consumed more ideological voting when they had more committee power, a greater brand name (i.e., longer tenure in office), or a more heterogeneous electorate. Based on that, they also concluded that the politicians' ideological voting (shirking) follows the law of demand.

However, it is premature to conclude that ideological voting behavior is shirking based on the fact that politicians' ideology is not a significant factor for votes on economic issues but is a significant determinant for votes on social issues. The conclusion is based on the assumption that social issues are not as closely monitored as economic issues by constituents, and therefore legislators can cheat constituencies. Quite often, however,

we have seen that social issues have turned out to be more important than economic issues in elections.[5] If so, a politician can make a political investment in social issues as well as economic issues. In this sense, the ideological voting on social issues should not be regarded as political shirking but should be regarded as a political investment.

It is equally unconvincing to conclude that ideological voting is shirking based on the fact that ideological voting was more frequently observed for legislators with higher committee power, a higher brand name, or a more heterogeneous electorate. In conjunction with the previous argument, higher committee power and a higher brand name would not be the return of political shirking but would be the return of political investment. The more heterogeneous the electorate, the easier it is for the politician to serve only his winning coalition. Therefore, from the average constituent's view, the politician may be a shirker, but from his electoral constituents' view, he is not.

In my dissertation, I revisit politicians' ideological voting behavior and check the validity of the usual claim by approaching it from a different dimension. The new litmus test is carried out within the framework of principal-agent theory. According to principal-agent theory, an agent who shirked in the contract period will be punished at the point

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[5]For example, patriotism and toughness on crime were the main issues in the 1988 presidential election.

of renewing the contract, and the agent who is faced with the final period of the contract will shirk. Should the ideological voting be political shirking, we then observe that retiring politicians are consuming more ideological voting than non-retiring politicians and that incumbent losers in elections consumed more ideological voting than incumbent winners.

The first essay examines the relationship between politicians' ideological voting and incumbency turnover. If the ideological voting behavior is shirking, then we observe the incumbent losers in reelection consuming more ideological voting than the incumbent winners. The empirical results reject the maintained hypothesis. Nevertheless, both the winners and losers were found to engage in a significant amount of shirking.

The second essay investigates the politicians' retirement decision and the ideological voting behavior in the final period. Hibbing (1982) showed that voluntary retirement decisions in the House of Representatives are mostly income motivated. In the first part of this chapter, I investigate the motivations behind senators' voluntary retirement decisions. I then examine the relationship between retirement and shirking. If senators decide to retire, would they shirk? If we find retiring politicians consuming more ideological voting, then it would be safe to conclude that ideological voting is shirking

because the retiring politicians have no incentive to make any political investment. Using the standard median voter version of the principal-agent model, I find that retiring senators consumed more ideological voting.

The empirical results of the two chapters shed some light on the interpretation of ideological voting. That is, as long as incumbent politicians want to run for reelection, they do not engage in political shirking, but if they decide to retire, then they do shirk.

The third essay revisits the empirical methodology which is widely used in the literature. The standard assumption of the literature is that the median voter is the principal for a politician. During my research, however, I have realized that many pairs of senators from the same states have distinctly different voting records, but they are reelected repeatedly. This means that at least one of the two senators is deviating from the median voter's preferences, but the shirker has been repeatedly rewarded with reelection instead of being punished.

To solve this puzzle, I have had to build a different principal-agent model, in which legislators could have different electoral constituencies. For example, Senator A can draw his winning coalition from the upper half of the income distribution, and Senator B can draw it from the lower half of the income distribution. Senators

representing those two coalitions will clearly behave differently.

To examine a senator's winning coalition, county level election turnout data and the socioeconomic characteristics were collected. Then the minimum chi-square method was applied to county level voting data to estimate the senator's voter share as a function of the characteristics. The regression results clearly showed evidence of different electoral coalitions for candidates in most states. After getting the characteristics of the electoral coalitions for incumbents, I tested these measures to find out whether they provide a better description of senators' behavior than average state characteristics. As expected, the electoral coalitions' characteristics better explained both the intrastate and the interstate variance of ADA ratings. However, the most significant factors of the behavioral difference were campaign contributions from political action committees and political party affiliation.

CHAPTER 2
INCUMBENCY TURNOVER AND IDEOLOGICAL VOTING

Introduction

The difficulties that challengers face in beating incumbents in the political markets have been studied in several dimensions. Netter (1983) showed that the campaign expenditures of an incumbent have such a positive effect on the probability of his re-election that they deter some from challenging him. Lott (1986) discussed a possibility that an incumbent's nonsalvagable brand name would deter the challenger's entry into political markets; the longer a politician has been in office, the larger are these investments and the quasi-rents associated with them, and thus the larger the barriers to entry.

Despite the theories, Figure 2-1 shows that senators have been been much less successful than House members in getting re-elected. It is especially noteworthy that the rate of success of senators in winning another term has declined drastically since 1960. Therefore, it is natural to ask why do some incumbent senators fail in reelections, despite their superior positions? Principal-agent theory provides the framework to answer this question. It is a

traditional treatment in the economic theory of politicians that legislators are agents of constituents in a political contract. Faithful agents will be rewarded with reelection (extension of the contract) and shirkers will be punished (termination of the contract). Kau and Rubin (1979) and Kalt and Zupan (1984) developed a methodology to measure legislators' shirking. In this chapter, I test a theory that incumbency turnover is a consequence of shirking.

The remainder of this chapter is organized as follows. In section 2, the literature reviews on the electoral control over legislators and on the legislative slack due to the imperfect control are presented. In section 3, a regression model is developed, the data are described, and the results of the empirical analysis are presented. The senatorial roll call voting in 1978 is used for the empirical test. In section 4, a further discussion on ideological voting based on the empirical results of section 3 is discussed. Finally, in section 5, a summary and conclusion are provided.

Electoral Control Over a Politician

The application of economic theory to the political arena has a rich foundation. The theory, which was mostly developed by Buchanan, Tullock, Niskanen, Peltzman, and Stigler to explain government budget setting, public

expenditure distribution, and government regulation, is referred to as the economic theory of politicians. Traditionally, an oligopolistic competition model has been employed to explain the low turnover rate of legislators. The remarkable stability of politicians in office is the consequence of the entry barriers to political markets: the incumbent can deter a challenger's entry to the political market through advertising and the brand name effect. For example, Lott (1986) showed that the net political support an incumbent receives is positively related to his level of brand name. The incumbent's brand name is nonsalvagable, and past investments in developing his brand name will affect his chances of staying in office. Netter (1983) treated campaign expenditures of a politician as advertising spending, and found evidence that the number of votes received by a challenger in an election was consistently and significantly reduced by the incumbent's advertising spending.

As we have seen in Figure 2-1, however, senators since 1960 have had greater difficulty than representatives getting re-elected. Senators' success at re-election furthermore has been declining since 1960. The entry barrier theory is unable to explain these facts.

There are two theories to explain who is elected in a representative democracy. One is the theory of electoral competition, which extends Hotelling's spatial competition

model to a two-party democratic system. In this model, the constituency compares platforms proposed by the candidates and elects the one with the preferred platform (McKelvey, 1975; Kramer, 1977; McKelvey and Ordeshook' 1985). This model does not take into account an incumbent's brand name effect and Williamsonian transaction cost advantage (Williamson, 1986) over a challenger. Only the platform is a decision variable, and predictions of election outcome depend upon whether or not the platform is a binding commitment. If an incumbent is not bound to his previous platform, and if constituencies are concerned only with the platforms proposed by the candidates, then it is always possible for an incumbent to gain reelection by proposing slightly more favorable platforms than the other candidates, no matter how he behaved in office. If an incumbent is bound to his previous platform and he cannot change his position, in other words, if the platforms are binding commitments, then non-incumbent candidates can always beat the incumbent by proposing a platform which gives slightly higher utilities to the constituency. Faced with this, the incumbent has no incentive to pursue his platform because he will be defeated anyway. In either case, the spatial competition model suggests the very unrealistic result that constituents would fail to control an elected officer.

The other view is the principal-agent approach to incumbency turnover (Ferejohn; 1986). In this model, the

relationship between politician and citizen is regarded as an agency relationship. The principal faces adverse selection (electing a poor quality candidate) and moral hazard problems (shirking in office). The principal's problems can be mitigated by designing an incentive contract as well as by developing an efficient monitoring system. In the representative democracy, it would be difficult for the constituency to design a better incentive contract than rewarding its agent with re-election. They evaluate officeholders on their actual performance in office rather than on platforms they might pledge during a campaign. Therefore, unlike the spatial competition model, elected legislators are controlled by the electorates in the principal-agent model; incumbency turnover is the constituency's punishment against the incumbent for his poor job performance.

However, the success of electoral control rests heavily upon the constituency's ability to monitor the legislator's performance (Weingast, 1984) and the political income he can garner (Barro, 1973). The legislator's moral hazard caused by limited monitoring and motivated by Barro's political income has been a hot issue in the economic theory of politicians.

Studies (Silberman and Durden, 1976; Kau and Rubin, 1979) have shown that politicians' behavior consists of two parts; one part is closely related to the economic and

demographic characteristics of their constituencies, and the other part is not explained by these characteristics but instead reflects the politicians' personal beliefs or ideology.[1] Although there is consensus that the first part should be the legislators' effort to serve the constituencies' economic interests, there are still controversies concerning the other part.

Kau and Rubin (1979) found that a politician's personal ideology was a significant variable in explaining his voting behavior. They found something that was significantly and systematically associated with voting which correlates with the ratings given to legislators by ideological groups. Peltzman (1984) recognized that different politicians were favored by different segments of a district's population. Thus, the usual treatment of a politician's ideology would be highly correlated with his own supporters' characteristics, which were omitted from Kau and Rubin's empirical model. After including the supporters' characteristics, he found the ideological ranking had less explanatory power than in Kau and Rubin's study, especially on economic issues. On the other hand, Kalt and Zupan (1984) found ideological voting was significant even in a narrowly defined economic issue (strip-mining).

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[1]Some ideological pressure groups compile ratings of representatives and senators. Among others, these are Americans for Democratic Action, Americans for Constitutional Action, the AFL-CIO Committee on Political Education (COPE), and the National Farm Union.

Nelson and Silberberg (1987) tried to reconcile the two contradictory results. They developed the notion of politicians' shirking in voting and suggested its magnitude would vary with the importance of the issue to their constituencies. They defined the politician's shirking as a politician's vote on the basis of his ideology rather than his constituency's preferences. They argued that politicians were aware of how costly shirking would be and, therefore, their voting behavior closely matches their constituents' economic interests when a proposed bill was expected to have great impact on the constituency. Politicians would shirk only when likelihood of detection, and thus the cost of shirking, is small. Nelson and Silberberg found that the role of ideology in senatorial voting was significant on general defense bills and not significant on specific defense bills. Kalt and Zupan (1987) also agreed with Nelson and Silberberg's view of ideological voting to be shirking. They found some evidence that senators with high brand name (i.e., greater tenure in office) and more political power consumed more ideological voting, which is consistent with a comparative static prediction of costly shirking.

To summarize, legislators do shirk under imperfect monitoring systems and a constituency will punish a legislator who consumes a relatively large amount of shirking in office. In the next section, I test the

hypothesis that incumbency turnover is the punishment for shirking.

Empirical Study

In this section, I test the hypothesis that ideological voting reduces the probability of reelection. I follow the methodology which the previous cross-sectional studies (Kau and Rubin, 1979; Kalt and Zupan, 1984, 1987) employed to measure ideology. This involves first running a regression of the senators' ideology rankings, say, ADA rankings, on the constituencies' socioeconomic variables. The residual then is considered as pure ideology.

The ADA model to be estimated is:

$$(2\text{-}1) \qquad ADA_i = a_0 + a_1 INC_i + a_2 UNI + a_3 URBAN_i + a_4 UNE_i + a_5 EDU_i + a_6 OLD_i + a_7 REG_i + \epsilon_i$$

where ADA_i is a senator i's ADA ranking, INC_i is the median income of the senator's state, UNI_i is the fraction of the workforce unionized in the senator's state, URBAN is the percentage of the state's population living in urban areas, UNE is the state's unemployment rate, EDU is the percentage of those aged twenty five or older who are high school graduates, OLD is the percentage of senior citizens in the senator's state, REG_i is the a regional dummy variable which

equals 1 for southern states and 0 otherwise. Data for this empirical study were obtained from Congressional Districts of the 98th Congress (1983) and Statistical Abstract of the United States (1981).

High income people, old people, and southern people have been documented to be conservative, while the unemployed, urban people, educated people, and unionized labor tend to be more liberal.

The regression results are reported in Table 2-1. We found that the constituencies' income, age, and region and the senators' party affiliation were significant characteristics in explaining senators' liberalism. Unlike the political science literature, I find positive relationships between a senator's ADA rating and income and the aged population. One possible answer for the positive effect of income on the ADA ranking is the effect of education on liberalism.[2] The positive signs for elderly population and union members are also not strange because

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[2]To see this, we ran a regression without having the EDU variable. The result is

$$\begin{aligned} ADA = & -785.6348 + 77.787\ INC + 3.564\ OLD - .131\ URBAN \\ & (-3.137) \quad (3.042) \quad (3.532) \quad (-.703) \\ & + 64.882\ UNION - 3.580\ REG + 20.019\ PARTY, \\ & (2.177) \quad (-.676) \quad (5.134) \end{aligned}$$

where t-statistics are in parentheses.

Without controlling the education, we get more significant t-statistics for the income variable. This suggests that we need to measure educational attainmnent more precisely, possibly using the distribution of educational attainment.

those two groups are the major beneficiary groups from liberalism. Finally, note that the education attainment, the unemployment rate, the unionization ratio, and the urbanization ratio of senators' electorate were not significant variables.

Next, I estimate the following relationship:

$$(2\text{-}2) \qquad V_{ij} = \alpha_j X_i + \beta_j RADA_i + u_j$$

where V_{ij} is a senator i's vote on a specific bill j, X_i is a vector of economic and demographic variables, and $RADA_i$ is the computed pure ideology of senator i. I observe V_{ij} to be 1 when he votes for and to be 0 when he votes against. Either a probit or a logit analysis estimates consistent maximum likelihood estimator α, β and variance.[3]

I used fifteen 1978 senator roll call votes to see whether or not there are significant behavioral differences in roll call votes between those who subsequently successfully sought re-election and those who later failed to get re-elected. Each year Congressional Quarterly selects a series of key votes on major issues on the basis of a matter of major controversy, a test of presidential or political power, and a decision of potentially great impact

[3]The conventional test of the economic theory of politics evaluates whether politicians' ideology plays a role in voting based on the coefficient of RDA.

on the nation and lives of Americans. I adopted Congressional Quarterly's key votes as my sample in order to limit discretionary sampling biases. The votes are described in Table 2-2.

Among the senators who participated in roll call votes in 1978, 56 senators won and 22 senators lost re-election in 1978, 1980, and 1982. A usual method to test for behavioral differences between the winners and losers would be to get the residual sum of squares from running equation 2-2 for each group and then apply an F-test. However, one cannot obtain asymptotic residuals from a small sample, that is, from the losers group (22 observations). To get around the problem, I applied the Chow test. The Chow test is designed to test the structural change when direct parameter estimation is impossible for one of the subgroups.

Residual sum of squares of the maximum likelihood method are obtained by the following relationship (Maddala, 1988).

$$\text{(2-3)} \qquad \max \text{Log } L = -\frac{N}{2}\left(\log 2\pi + \log RSS - \log N + 1\right)$$

where max Log L is the maximum log-likelihood ratio, RSS is the residual sum of squares, N is the number of observations. Using the F-statistic, I test for behavioral differences in roll call votes between the winners and losers in re-election.

Table 3-3 reports the Chow test results of the 15 selected votes. Among the 15 selected votes, 14 of them showed no difference in voting between the winner and loser group. The two groups voted marginally differently only on one bill, the equal rights amendment bill. Therefore, one may conclude that there are no significant differences in voting behavior between the winners and the losers.

However, we are particularly interested in the significance of the estimate of pure ideology for the loser group, that is, whether or not the losers' ideological voting damages themselves. To see this, I create a dummy variable, D, setting D = 0 for the winners and D = 1 for the loser. The model to be estimated is:

$$V_{ij} = \alpha_i X_i + \beta_i RADA_i + \delta_i (D \cdot RADA) + u_i \qquad (2\text{-}4)$$

where (D·RADA) is an interaction term between the dummy and RADA. If the usual hypothesis is correct, the estimate of δ should be significant for the losers. The estimates of equation 2-4 are reported in Table 2-4. RADA is a significant factor in ten votes, but (D*RADA) was significant only in two votes. The two bills, in which the loser's group consumed significant RADA in voting, were the equal rights amendment and the senate tax bill.

Pearson's P_λ test is an overall test for significance of the null hypothesis which combines the results of each

independent test. If there are k independent tests, and the critical value for each test is P_k, then the test statistic for the overall test is distributed χ^2 with 2k degrees of freedom.

$$(2\text{-}5) \qquad \lambda = \sum_k (-2 \log P_k) \quad \chi^2_{2k}$$

The overall test results, which are reported in Table 2-5, show the constituency's unemployment rate, the aged population ratio, the urbanization ratio, and region, a senator's party affiliation, and the pure ideology measure were significant factors in affecting a senator's roll call votes. However, neither the percentage who graduated from high school, the unionization ratio, nor the income level were significant factors. Most importantly, the interaction variable between the loser and ideological voting was not significant. To interpret the regression result, first, the constituency's economic characteristics well explain senators' voting outcome, and second, senators are consuming a certain amount of shirking, but there is no difference in the magnitude of shirking between the winners and the losers.

There is another test for the importance of shirking, which has not been performed. If the ideological voting behavior is political shirking we should observe that the

votes of losers are more responsive to their ideology than are the votes of winners, that is, $|\beta_i + \delta_i| > |\beta_i|$ in equation 2-4.

A Further Thought on Ideological Voting As Shirking

The empirical results of the previous section rejected the maintained hypothesis that incumbency turnover reflects errant politicians being punished by the electorate. There may be two possible reasons for obtaining this result. First, the result may be due to the poor measurement of shirking. I used the average characteristics of a state as proxies for the constituency's characteristics. However, as Peltzman (1984) argued, a legislator should be sensitive to representing his supporters and marginal voters and not the average voters. A senator who is not representing the average voter is not, from his supporters' view, necessarily shirking. At the same time, finding no evidence of shirking by losers by using the average voters' characteristic does not necessarily mean the losers were faithful servants.

On the other hand, a group of economists disagrees with the traditional view of ideological voting as shirking. Lott (1987) suggested the possibility that ideological voting could be a political investment rather than political shirking. He argued that politicians' ideology would be a political brand name under contractual uncertainty; a self-

enforcing agreement between two parties remains in force as long as each party believes himself to be better off by continuing the agreement than he would be by ending it. During the final period in office, cheating would be more profitable than faithfulness to the agreement (Telser, 1980). A legislator who faithfully represented a constituency's preference for re-election purposes would not have any incentive to behave the same way when he decided to retire. Lott (1987) concluded that constituencies would prefer ideological politicians to avoid these lame-duck problems, which are assumed to be more important for nonideological politicians.

Dougan and Munger (forthcoming) also argued that politicians' ideology is an investment in reputation. Ideological reputations serve as low-cost signals of future performance. Politicians are willing to incur some costs to maintain ideological reputation. Therefore, in the short run an ideological incumbent's legislative votes may deviate somewhat from the preferences of his constituents, and thereby he is building the long run credibility to serve the constituency's preference.

Voluntary mobility is a good example of why a politician may want to keep his ideological brand name for long term utility maximization (Adams and Kenny, 1986). The Tiebout hypothesis predicts that the preference variation of a group gets larger as the size of a group

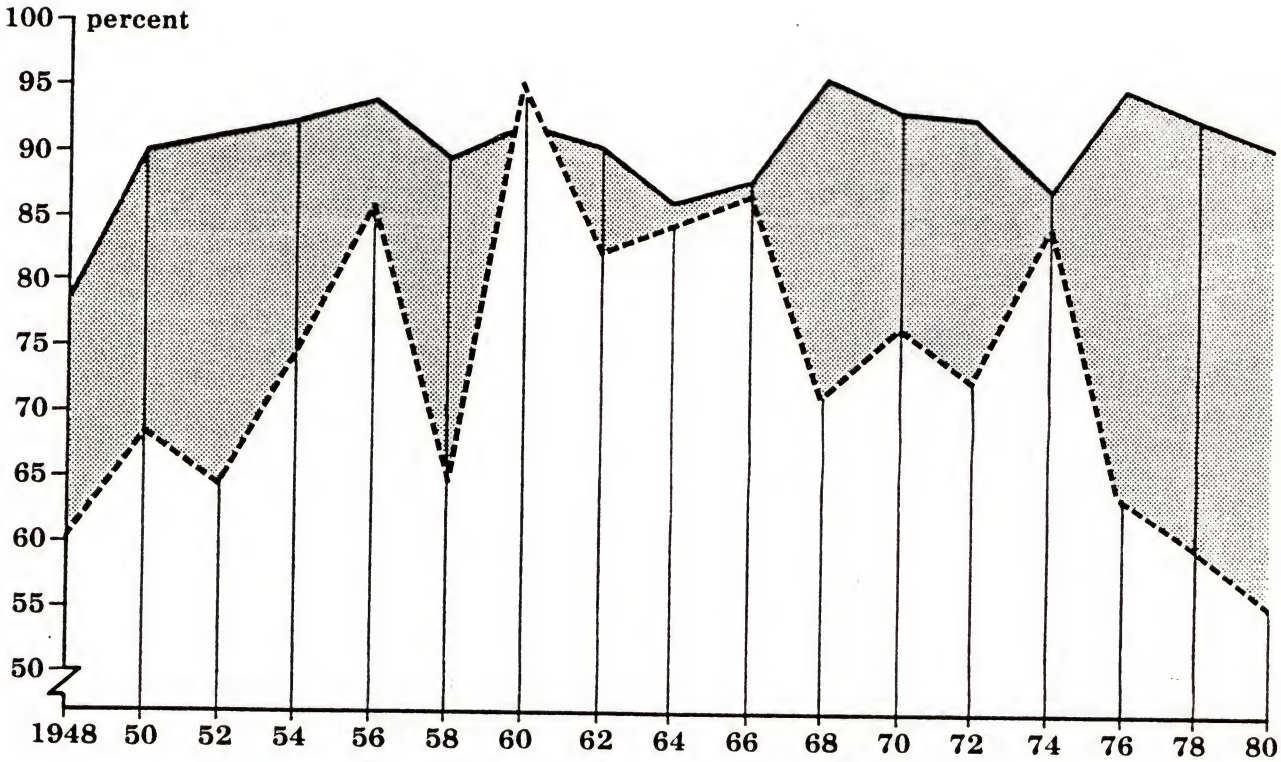
becomes bigger. Politicians who move to higher elected offices inevitably face different median voters. If a politician changed his ideological position to mirror the median voter's preferences for each successive office sought, it would make him inconsistent and indecisive. Consequently, a politician desiring to move to a higher level of the political pyramid should have a consistent ideological reputation to provide voters with a strong signal about his future actions.

Summary and Conclusion

In this chapter, we have tried to explain incumbency turnover within the context of the principal-agent theory. The principal-agent theory predicts that if an incumbent performs well in representing his constituency's preferences, then he will be awarded re-election and if he reneges, then he will be punished with a loss. I computed the shirking measure in the traditional way and carried out several tests to see if there were any behavioral differences in voting between the winners and the losers in re-election. Most of our explanatory variables on constituencies' economic and demographic conditions explained the voting behavior of an incumbent senator as predicted by the economic theory of politicians. However, I found no evidence of behavioral differences in voting

between the winner group and the loser group. Furthermore, a senator's pure ideology, or shirking, was not significantly related to the loser group's voting behavior. The empirical result rejected the maintained hypothesis.

The result may be because the shirking is not precisely measured or because the ideological voting is in fact not shirking. This indicates that further studies are needed. First, a new shirking measure should be obtained by using the characteristics of politicians' supporters. Second, if ideological voting is in fact shirking and if an incumbent does not shirk as long as he runs for re-election, then we may be able to find the evidence of shirking from retiring senators. Third, if ideological voting indeed creates brand name capital, and if both winners and losers have the same magnitude of a brand name, incumbency turnover should be analyzed along with other factors such as a challenger's campaign expenditure and his brand name.



——— House members who successfully sought re-election.

------ Senate members who successfully sought re-election.

Figure 2-1: Success in Winning Another Term

Source: Congressional Quarterly's Guide to Congress (1982), pp. 430.

Table 2-1

Constituencies' Influence on the Senatorial Ideology Ranking

Variable	Estimate	Std. Error	t	Mean
intercept	-602.6628	262.8345	-2.293	1
EDU[a]	-.4426452	.4654351	-0.951	67.57879
UNE[b]	.8437546	1.465008	0.576	6.415152
INC[c]	62.67775	27.04105	2.318	9.712896
UNI[d]	11.42304	37.04623	0.308	.2219697
OLD[e]	2.845417	.9887185	2.878	15.37475
URBAN[f]	.0237441	.1734444	0.137	67
PARTY[g]	29.32554	3.892914	7.533	.6262626
REG[h]	-20.59988	8.023951	-2.567	.2525253
F	14.03			
Adjusted R^2	.5155			

Source: Bureau of the Census. Congressional Districts of the 98th Congress (1983).

[a]EDU=percentage of high school graduate and over,
[b]UNE=unemployment rate,
[c]INC=log of the median income,
[d]UNI=fraction of labor force unionized,
[e]OLD=percentage of population over 65,
[f]URBAN=percentage of urbanization,
[g]PARTY=1 for the Democrats,
=0 otherwise.
[h]REG=1 for the following states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia.
=0 otherwise.

Table 2-2

The Description of Votes

Bill Code	Issue	Total Vote yea nay	By Party Rep	Dem
78-1 HR5289	Natural Gas Pricing	39-59	21-15	18-44
78-2	Panama Canal Treaties	68-32	16-22	52-10
78-3 S Con Res 86	Mideast Fighter Plane Sales	44-54	11-26	33-28
78-4 S 3076	Foreign Military Aid	39-57	27-11	12-46
78-5 S Con Res 80	Defense Spending	21-70	4-31	17-39
78-6 S Con Res 80	Defense Spending	21-74	17-17	4-57
78-7 S 2493	Airline Deregulation	69-23	28-6	41-17
78-8 HR 8309	Waterway User Fees/ Water Projects	43-47	16-19	27-28
78-9 H J Res 554	D.C. Voting Rights	67-32	19-19	48-13
78-10 H J Res 638	Equal Rights Amendment	44-54	24-13	20-41
78-11 HR 5285	Hospital Cost Control	42-47	25-6	17-41
78-12 S 1753	Court-Ordered Busing	49-47	12-26	37-21
78-13 HR 6782	Emergency Farm Aid	67-26	26-11	41-15
78-14 HR 13511	Senate Tax Bill	52-43	13-23	39-20
78-15 HR 8410	Labor Law Reform	58-41	14-24	44-17

Source: Congressional Quarterly. Congressional Quarterly Weekly Report (1978).

Table 2-3

Behavioral Differences in the Senatorial Roll Call Voting Between Winners and Losers

Bill	LR_1[a]	LR_2[b]	URSS[c]	RRSS[d]	F	SIG. LEV
78-1	-39.81656	-28.73611	64.95197	46.38328	.8916475	.6045216
78-2	-13.83354	-8.452971	126.4541	95.71134	.7154075	.8020443
78-3	-38.12664	-25.61101	67.82829	51.8601	.6857973	.8311749
78-4	-16.79276	-12.48416	117.2141	82.87768	.9227646	.568461
78-5	-18.3062	-10.89053	112.7526	87.7315	.6352202	.8761747
78-6	-12.21412	-11.40377	131.8155	86.13805	1.181082	.3064538
78-7	-25.19356	-17.67533	94.49974	68.85251	.8296485	.6766005
78-8	-40.79961	-25.93889	63.33525	51.25636	.5248711	.9491443
78-9	-36.95803	-17.52765	69.89149	69.21663	.0217158	1
78-10	-16.28792	-17.52765	118.7413	69.21663	1.593618	.0879064
78-11	-16.89874	-8.967705	116.896	93.96793	.5434522	.9394494
78-12	-21.85587	-17.81527	102.9434	68.50925	1.119471	.3605584
78-13	-37.7757	-29.48634	68.44141	45.15699	1.148455	.3343526
78-14	-38.024	-25.71207	68.00704	51.67326	.7040349	.8134506
78-15	-2.34e-07	-2.89e-07	180.2934	129.4414	.8749999	.6239103

[a]LR_1=log likelihood ratio of the restricted regression
[b]LR_2=log likelihood ratio of the unrestricted regression
[c]URSS=unrestricted residual sum of squares
[d]RRSS=restricted residual sum of squares

Table 2-4

Factors Affecting Senatorial Roll Call Voting

Bill	EDU	UNE	INC	UNI	OLD	URBAN	PARTY	REG	RADA	D*RADA
78-1	-0.0325	-0.5345	3.0856	-4.6001	-0.0812	-0.0017	-1.2502	0.4062	0.0115	0.0054
	(-0.447)	(-1.974)	(0.776)	(-0.779)	(-0.586)	(-0.057)	(-2.017)	(0.315)	(0.542)	(0.150)
78-2	-0.1287	0.1868	8.7755	3.6951	0.4894	0.1087	5.3676	-2.4662	0.1585	0.0263
	(-0.678)	(0.332)	(0.801)	(0.295)	(1.368)	(1.493)	(3.403)	(-0.855)	(2.616)	(0.330)
78-3	0.0248	0.1200	1.0713	-6.5080	0.2472	0.0609	1.4399	-1.4008	0.0838	-0.0579
	(0.337)	(0.475)	(0.242)	(-1.120)	(1.600)	(1.897)	(2.115)	(-1.063)	(2.895)	(-1.455)
78-4	0.2745	-1.7759	-9.1379	33.9988	-1.0443	-0.1642	-10.2411	12.4464	-0.0816	-0.1454
	(1.485)	(-2.497)	(-1.117)	(2.249)	(-2.486)	(-1.858)	(-2.890)	(2.361)	(-1.730)	(-1.441)
78-5	-0.0346	0.3708	13.6409	-6.4785	0.8647	-0.0050	2.2419	.[a]	0.1042	-0.0344
	(-0.254)	(0.783)	(1.763)	(-0.719)	(1.922)	(-0.111)	(1.930)		(2.456)	(-0.705)
78-6	-0.1665	-0.8179	-3.4506	-0.6609	-0.4544	0.0170	-4.4131	.[b]	-0.1128	0.0204
	(-1.592)	(-1.542)	(-0.454)	(-0.061)	(-1.341)	(0.298)	(-3.107)		(-2.159)	(0.272)
78-7	-0.1285	0.3131	0.3090	-15.5477	0.1721	0.1214	-0.0986	-3.6908	0.0765	0.0367
	(-1.208)	(1.031)	(0.046)	(-1.851)	(0.754)	(2.382)	(-0.105)	(-1.869)	(2.243)	(0.620)
78-8	-0.0919	0.0265	8.3266	-7.9881	0.3123	0.0072	0.7356	-2.0181	0.0062	-0.0023
	(-1.315)	(0.092)	(1.809)	(-1.398)	(1.945)	(0.261)	(1.217)	(-1.684)	(0.308)	(-0.073)
78-9	-0.1108	0.1837	8.0077	-6.8907	0.2714	0.0248	1.6468	-2.6104	0.0330	-0.0235
	(-1.451)	(0.769)	(1.625)	(-1.261)	(1.563)	(0.792)	(2.276)	(-1.817)	(1.361)	(-0.698)
78-10	0.2210	-0.5674	-16.3412	6.8292	-0.8695	-0.0440	-5.2950	7.7988	-0.1680	0.1321
	(1.403)	(-1.305)	(-1.648)	(0.693)	(-2.609)	(-0.687)	(-2.922)	(2.610)	(-2.924)	(1.961)
78-11	0.0064	-0.8344	-11.0863	-2.9615	-0.9059	-0.0470	-7.3631	2.7013	-0.0788	0.0128
	(0.045)	(-1.918)	(-1.311)	(-0.322)	(-2.368)	(-0.752)	(-3.226)	(0.976)	(-1.705)	(0.255)
78-12	-0.0022	-0.6043	1.0011	12.5014	0.2599	-0.0541	2.8057	-3.5310	0.1102	0.0779
	(-0.024)	(-1.208)	(0.140)	(1.373)	(0.906)	(-1.216)	(2.692)	(-1.655)	(2.844)	(1.115)
78-13	0.1806	0.1248	-0.6231	2.5564	0.2056	-0.0520	-0.3870	3.9943	-0.0017	0.0080
	(2.176)	(0.472)	(-0.142)	(0.450)	(1.073)	(-1.889)	(-0.614)	(2.477)	(-0.079)	(0.238)
78-14	0.1314	0.6512	2.2431	-5.5810	0.3280	-0.0310	1.0324	-0.6564	0.0780	-0.0664
	(1.793)	(2.172)	(0.512)	(-1.004)	(2.148)	(-1.096)	(1.538)	(-0.518)	(2.972)	(-1.821)
78-15	-0.0607	-0.0351	5.8927	15.3247	0.1204	-0.0561	.[c]	-4.4407	0.1593	-0.0136
	(-0.518)	(-0.103)	(0.793)	(1.733)	(0.409)	(-1.376)		(-2.064)	(3.080)	(-0.235)

Note: t-statistics are parentheses.

[a] REG is deleted in estimating Bill 78-5 because REG predicts $V_i = 0$ perfectly.

[b] REG is deleted in estimating Bill 78-6 because of collinearity with V_i.

[c] PARTY is deleted in estimating Bill 78-15 because of collinearity with V_i.

Table 2-5

Pearson's Test

VARIABLES	LAMBDA	SIG. LEV
intercept	34.35004	.2670557
EDU	33.80903	.2885318
UNE	41.23582	.0830616
INC	31.92136	.3711935
UNI	38.96688	.1264725
OLD	63.15209	.0003761
URBAN	42.6723	.0626065
PARTY	90.88152	1.44e-08
REG	59.2508	.0002113
RADA	93.08487	2.22e-08
D*RADA	27.59713	.591776

CHAPTER 3
THE SENATORIAL RETIREMENT DECISION AND THE FINAL PERIOD PROBLEM

Introduction

Why does a politician retire? Is it in response to a poor probability of re-election? Does he quit to have a better paying job? Or is it simply because he is sick?

Retirement from labor force participation is generally a voluntary decision. That is, if the expected utility from retirement is higher than the expected utility from participating in the labor force, one would decide to retire. It has been shown that social security benefits and private pension benefits have an important impact on a worker's retirement decision (Burkhauser and Quinn, 1983; Burkhauser and Turner, 1978; Diamond and Hausman, 1984). However, for some occupations such as senators and congressmen, the connection between the retirement decision and the age at which retirement benefits go into effect is more tenuous.

Hibbing (1982) presented possible reasons for a congressman's voluntary retirement decision, such as job mobility, congressional redistricting, the congressional

salary and pension, and electoral competition. He also found that historically in the House of Representatives retirements were mostly job changes.[1]

This chapter examines the factors that affect a senator's retirement decision and shows to what extent the senatorial retirement decision is consistent with the income motive (job changes) and how it is affected by other factors such as the probability of losing re-election. The effect of the retirement decision on a senator's job performance in the final term of office is the next logical problem confronted by the politician's constituents. The literature on the time horizon problem and principal-agent relationships suggests shirking will emerge.

Along with the retirement decision, the behavioral differences between those U.S. senators who choose to leave and those who choose to stay are also examined. Lott (1987) found no empirical evidence of behavioral differences in voting between retiring congressmen and non-retiring congressmen when examining changes in ideological ranking across retiring and nonretiring congressmen between the 94th and 95th Congress. This hypothesis will be tested in a

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[1] From 1900 to 1970, 869 representatives voluntarily retired from the House. He collected the information on the post-congressional activities of 747 of them. Of these 747, only 112 left the work force after their stay in Congress. Eighty-five percent of the retirees did not retire: they changed jobs (Hibbing, 1982, p. 8).

slightly different way by utilizing the method developed by Kau and Rubin (1979).

Chapter 3 is organized as follows. In section 2, a retirement decision model based on a self-selection rule is presented. An empirical model is then derived to test senators' retirement motives, and the estimation results follow. In section 3, an empirical model is designed to test the behavioral differences between the retiring senators and other incumbents in congressional roll call voting, and the empirical results are reported. Finally, in section 4, the summary and conclusion of this paper are provided.

Retirement Decision Model

In the standard labor supply model, retirement is a voluntary decision dependent upon the relative magnitudes of the expected utility from retirement versus the expected utility from working. However, under uncertainty, unanticipated risks such as sickness or layoff also affect the retirement decision (Diamond and Hausman, 1984).

Even though it may be reasonable to view the senatorial job in the context of other occupations, it makes little sense to explain the retirement decision of a senator solely on the basis of a retirement pension or other social security benefits. The job of a United States senator is

unlike most other occupations because a substantial amount of pecuniary investment, such as campaign funds, and non-pecuniary investment, such as community service history, are required for an individual to be a senator. The higher starting age and higher average age of an elected officer group suggest the magnitude of these start-up costs. For example, the average age of the newcomer senators of the 95th Congress was 44.4 and the average age of the entire senate was 54.7. The implied large investments for the job-specific human capital require longer periods to recovery. While earning this return, an incumbent also produces brand name capital, which causes competitive entry to be more costly.

This evidence implies that a senator's retirement decision should be explained by senators' specific characteristics as well as general ones. Let us now more formally model the senator's retirement decision. For simplicity, I only consider income, working hours, and senators' specific characteristics as the arguments of his utility function. A senator's utility function is given

$$(3\text{-}1) \qquad U_s = U_s\ (Y_s + V,\ W_s\ ;\ X),$$

where Y_s is the senatorial income, V is nonwage income, W_s is the hours of work, and X is a vector of the senator's

characteristics. Similarly, a senator's post-retirement utility function is written

$$(3\text{-}2) \qquad U_r = U_r\ (Y_r + V,\ W_r\ ;\ X),$$

where Y_r is the post-retirement income, and W_r is the hours of work if he resumes work after retirement. We observe W_r=0 when he does not work.

Assuming that the utility function is separable and linear in the arguments, the utility maximizing retirement decision depends upon the following function.

$$(3\text{-}3) \qquad I^* = U_s\ (Y_s + V,\ W_s\ ;\ X) - U_r\ (Y_r + V,\ W_r\ ;\ X)$$
$$= \alpha(Y_s - Y_r) + \beta(W) + \pi X + \epsilon,$$

where W is the difference between W_s and W_r and ϵ is an unobservable random error term which has a zero mean. W captures the senatorial job specific efforts, which depend upon the population of his state (a proxy for constituency services) and whether or not he has a safe electorate (an indication of expected campaign cost to win re-election).

The retirement decision is given by

$$(3\text{-}4) \qquad RET = 1 \text{ if } I^* < 0$$
$$= 0 \text{ if } I^* \geq 0,$$

where RET equals 1 for senators who retire and equals 0 otherwise. In other words, the probability of retirement depends upon the difference of income, senatorial job-specific efforts, and a senator's characteristics such as bad health.

This suggests the following empirical model.

$$\text{(3-5)} \qquad RET = b_1 + b_2\ GAP_i + b_3\ GEN_i + b_4\ PRI_i + b_5\ POP_i + b_6\ OLD_i + u_i$$

where GAP is the difference between the post-retirement income and the pre-retirement income, GEN is the vote margin in the previous general election, PRI equals 1 if the senator was unopposed in the previous primary election and 0 if the race was contested, POP is the population for senator i's state, and OLD is the age of a senator at the end of incumbency.

If the income difference motivates retirement, then we will observe a significantly positive coefficient for GAP. If retirement is an internalization of uncertain risks of running for re-election, then the coefficients for GEN and PRI will be significantly negative; re-election obviously is less likely and less certain for senators who faced opposition in the primary or who just edged past their

opponent in the general election.[2] It is much more costly for these senators to win re-election. POP is intended to capture the time cost of constituency service work.[3] Hence, I predict that the sign of POP will be positive. OLD is a senator's characteristic variable and is a proxy for sickness. As a senator gets older, he is more likely to fall ill and thus be unable to work. Voters apparently recognize this and are less likely to return old elected legislators to office (Adams and Kenny, forthcoming). Therefore, the sign for the coefficient of OLD is predicted to be positive.

However, a problem is immediately encountered in the attempt to estimate equation 3-5. Post-retirement income cannot be observed. Therefore it is impossible to compare the magnitude of the two incomes. That problem is circumvented by using a latent variable. If a senator is observed having a job immediately after retirement, it is assumed that income had a factor in his retirement. And those who decide to run re-election campaigns are assumed to

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[2]We should note that there may be some endogeneity between the general election results and the primary election results. For example, if a certain state has a tendency of favoring the Democrat then the primary election would be more competitive than the general election.

[3]Hibbing (1982), in his interviews with twenty-four retired members of the 1978 House retirement class, found costs of congressional service to be extraordinarily high. Those costs include familial sacrifices, the fishbowl factor--congressmen and their families being scrutinized by media as well as by constituents--ethics provisions, financial disclosure, constituency service work, etc.

enjoy greater current income than the next best alternative. These assumptions are strong but not too unreasonable. If we define LFP to be a dummy denoting a senator's labor force participation, then

(3-6) $LFP = 1$ if post-retirement income is greater than the pre-retirement income.

$= 0$ otherwise

Then, the model to be estimated is

(3-7) $$RET = b_1 + b_2\ LFP_i + b_3\ GEN_i + b_4\ PRI_i + b_5\ POP_i + b_6\ OLD_i + u_i$$

To test the senatorial retirement decision, I selected 97 senators who either retired or ran for re-election during the period of 1976 to 1980. Among them, 21 senators retired from the senate and 76 contended re-election. The data on age, primary election results, and general election results were obtained from the Congressional Quarterly. The data on population and labor force participation were obtained from the Congressional District of the 98th Congress (1983) and Who's Who in America (1970 through 1984), respectively.[4]

[4]If a senator is retired, then Who's Who in America reports 'retired US senator.' If he has resumed his work as a lawyer, then he is reported as 'lawyer, a former US senator.'

The logit results for equation 3-7 are reported in Table 3-1. All variables have expected signs except the population variable. However, only the age variable is significant. Older setors are more likely to retire. Retirement is not significantly related to the labor force participation measure. The insignificant coefficients of the risk measures (PRI and GEN) suggest that senatorial retirement is not an internalization of the risk of running for re-election. A low winning margin seems to be an indication of an unsafe electorate, but it may reflect senators' cost minimization behavior in producing votes. Senators would increase efforts to the level where they can defeat the other candidate with the least cost.

In summary, the results show that senatorial retirement is neither a job change nor an internalization of the risk of running for re-election. Only the factors beyond the control of senators such as bad health (proxied by age) push them to retire.

The Voting Behavior of Retiring Senators

The economic theory of politicians predicts that an incumbent will vote in favor of his/her constituency's preferences. The theory, based on the principal-agent theory of the economics of organization, hypothesizes an incumbent to be the agent and the electorate to be the principal.

Telser (1980) argued that a self-enforcing agreement between two parties remains in force as long as each party believes himself to be better off by continuing the agreement than he would be by ending it. In other words, both parties continue to adhere to an agreement if and only if each gains more from adherence to, than from violations of, its terms.

One obvious problem arises when both parties face the last period of a contract: there are strong incentives for both parties to cheat in the final period of the contract. It is, however, easy to see that the same argument applies to the next-to-last transaction, and so on, to the first. That is, there is no way to establish a self-enforcing contract when the contract is viewed in a finite setting.

If we consider the incumbent-electorate relationship in the context of a political contract, it is natural to cast doubt on the job performance of the agents in the final period of the contract. To see whether or not Telser's

arguments hold for final period senators, I examine how their voting behavior deviates from their constituencies' preferences. According to Weingast (1984), even though a constituency does not pay much attention to an incumbent's behaviors, his/her behavior is well monitored by special interest groups, and they will be well informed on the incumbent's behavior. Recognizing this, an incumbent who desires re-election will tend to represent his electorate's preferences. However, a retiring senator may not have as much incentive to perform at a high level, unless his future job is related to his political record.

Voting based on the senator's ideology is used as a measure of opportunistic behavior (Peltzman, 1984; Kalt and Zupan, 1984, 1987; Nelson and Silberberg, 1987). My hypothesis is that the retiring senators consume more ideology than those who seek re-election. To estimate the pure ideology, I first regress an ideology ranking, say, the ADA ratings, on the constituencies' socioeconomic variables. The resulting residual will be defined to be the pure ideology.

The ADA model to be estimated is written

$$(3\text{-}8) \qquad ADA_i = a_0 + a_1 INC_i + a_2 UNI_i + a_3 URBAN_i + a_4 EDU_i + a_5 OLD_i + a_6 REG_i + \epsilon_i,$$

where ADA_i is senator i's 1978 ADA ranking, INC_i is the median income of senator i's state, UNI_i is the unionization rate in that state, $URBAN_i$ is the urbanization rate, EDU_i is the percentage who are high school graduates, OLD_i is the percentage of senior citizens in the state, REG_i is a regional dummy variable which equal 1 in the south and 0 otherwise.[5] The variables are selected based on studies that have shown high income people, elderly people, and southern people to be conservative and the unemployed, urban people, educated people, and unionized labor to be more liberal (for example, Fiorina, 1974). I define the residual of the estimate to be the pure ideology.

(3-9) $$RADA_i = ADA_i - PADA_i$$

where $RADA_i$ is the value of the residual ADA_i, and $PADA_i$ is the predicted value.

Table 3-2 has the regression result of equation 3-8. In the test A, we regressed the senators' ADA rankings on socio-economic variables of their states. In test B, we included the party variable in the same regression. In the tests, a state's median income, the older population ratio, and unionization ratio are significant variables. Unlike

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[5]REG=1 for the following states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia.

the political science literature, we find positive relationships between a senator's ADA rating and income and aged population. The effect of education on liberalism is a possible explanation for the relationship between income and liberalism. The positive signs for older population and union members are also understandable because those two groups are the major beneficiary groups from liberalism.

Obtaining senators' pure ideology, I carried out a test which compares the job performance of the retiring senators with other senators in 1978. To do this, the voting records of the senators were regressed on the constituencies' socio-economic variables, the measure of pure ideology, a dummy variable for the voluntarily retired senator group, and a dummy interaction variable on ideology.

The model is written as

$$V_{ij} = \alpha_j X_i + \beta_j RADA_i + \pi_j RET_i + \delta_j (RET_i * RADA_i) + u_j, \tag{3-10}$$

where V_{ij} is a senator i's vote on a specific bill j, RADA is pure ideology, (RET*RADA) is a dummy interaction variable. V_{ij} is set equal to 1 for positive votes and to 0 for negative ones. Either a probit or a logit analysis would provide consistent maximum likelihood estimators.

Previous studies found that the pure ideology is a significant determinant of senators' voting behavior and that ideological voting follows the law of demand.[6] If so, it would be legitimate to assume that there exists an optimal amount of shirking that their constituencies think of as an acceptable agency cost. I predict β_j to be significant. In addition to that, if there should be different voting behavior between the retired senators and the incumbent senators then π and, especially, δ should be significant.

I selected 15 senator roll call votes to test for the final period problem. Each year the Congressional Quarterly selects a series of key votes on major issues on the basis of a matter of major controversy, a test of presidential or political power, and a decision of potentially great impact on the nation and lives of Americans. I adopted the Congressional Quarterly key votes to study. Table 3-3 contains a description of the selected key votes.

I estimated the equation 3-10 for all the senators who participated in the 1978 congressional roll call voting. There were ten senators retiring at the end of 1978. In the 10 regressions, there was variation in the significance level of each variable across bills. However, one cannot

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[6] If shirking is cheap, in other words, constituents do not care about the outcome of voting on a certain bill, a senator will consume more personal ideology, and vice versa.

determine overall significance of a variable by a simple counting rule. The Pearson's P_λ test was applied to test the overall significance of the null hypothesis. That is, if there are k independent tests, and the critical value for each test is P_k, then the test statistic for the overall test is distributed χ^2 with 2k degrees of freedom.

$$(3\text{-}11) \qquad \lambda = \sum_k (-2\log P_k) \sim \chi^2_{2k}$$

The overall test result is reported in Table 3-4. In the first column of Table 3-4 (TEST C), which pertains to all senators in 1978, there are no behavioral differences in ideological voting between the retiring senators and the other senators. Almost all variables contribute to the explanation of senatorial voting. The dummy for the south, the retirement dummy (RET), and the dummy interaction between retirement and ideology (RET*RADA) were not significant.

Next, I carried out the same test for the group of senators who were elected in 1972 (reported in TEST D of Table 3-4). In 1972, 33 senators were elected, and 30 of them remained by the end of 1978. Among them, 10 senators decided to leave, and 20 senators were competing for re-election. Interestingly, there was significantly different behavior in ideological voting between the retiring senators and the incumbents for this observation. Both RET and

(RET*RADA) were significant at the 10 percent level. That is, the retiring senators not only voted for their constituents' preferences but also consumed their own ideology.

I believe that the different results were due to imperfect sample separation with respect to the retirement dummy (RET). For the Test C, I defined RET=1 when a senator retired in 1978. However, among the senators who were classified as RET=0, there were eight incumbents who retired in 1980 or 1982. If their retirement decision was made in 1978, and shirking began in the 1978 senatorial roll call voting, then we might not find different behavior between the 1978 retired group and the others. I plan to try a different classification scheme in future work.

This sample separation problem was not present when the class of 1972 was considered. They faced either retirement or re-election. Therefore, one should observe significant behavioral differences in on-the-job consumption between the retiring group and the non-retiring group, if there is a final period problem. The result of test D supports the hypothesis that the cost of ideological voting is less expensive for those who retire. They consume more shirking than those who run for re-election.

Summary and Conclusion

This chapter examined the senatorial retirement decision and job performance during the final term of office. I attempted to ascertain which factors contributed to a senator's retirement. The income and uncertainty hedging motives were considered in detail, and the data rejected both hypotheses. Neither labor force reentry of senators after retirement nor risk measures were found to be significant. Only a senator's age was significant in explaining the probability of his retirement. In line with the retirement decision, I tested the retiring senators' job performance in the final period. Unlike Lott (1987), I found significant shirking in the final period. That is, retiring senators consumed more ideological voting, which should be costly if they ever wanted to be re-elected.

Table 3-1

Senatorial Retirement Decision: Logit Estimates

Variable	Coefficient	Std. Error	T-ratio	(Sig.Lvl)	Mean
intercept	-6.56979	2.545	-2.581	(0.00984)	1.0000
OLD	0.114113	0.3106E-01	3.674	(0.00024)	58.825
GEN	-0.270771E-01	0.3082E-01	-0.879	(0.37957)	58.230
PRI	-0.368854	0.5687	-0.649	(0.51660)	0.43299
LFP	0.855128	0.6207	1.378	(0.16828)	0.22680
POP	-0.712863E-04	0.9388E-04	-0.759	(0.44764)	3360.0

Log-Likelihood.....	-41.100
Restricted (Slopes=0) Log-L.	-50.676
Chi-Squared.....	19.152
Degrees of Freedom.....	5
Significance Level.....	0.18008E-02

Table 3-2

ADA and Constituents' Characteristics

Variable	TEST A Estimate	Std. Error	TEST B Estimate	Std. Error
intercept	-658.21951[b]	312.7247	-680.78177[b]	276.7978
INC	63.97298[c]	33.7167	64.08518[b]	29.8395
OLD	3.78059[a]	1.1409	3.53581[a]	1.0108
URBAN	-.24920	.2104	-.14195	.1874
UNION	89.31584[b]	36.5211	76.22372[b]	32.4205
EDU	.25739	.4855	.38482	.4304
REG	1.62474	7.0144	-.66561	6.2236
PARTY			20.21953[a]	3.9102
F	5.464		9.800	
R^2	.260		.427	

Note: 1. a, b, and c are significant at 1, 5, 10 percent level, respectively
2. The definition of variables are in the section 3.

Source: Bureau of the Census. Congressional Districts of the 98th Congress (1983).

Table 3-3

Selected Roll Call Votes from 1978

Bill Code	Issue	Total Vote yea nay	By Party Rep	Dem
78-1 HR5289	Financing Natural Gas Pricing	39-59	21-15	18-44
78-2	Panama Canal Treaties	68-32	16-22	52-10
78-3 S Con Res 86	Mideast Fighter Plane Sales	44-54	11-26	33-28
78-4 S 3076	Foreign Military Aid	39-57	27-11	12-46
78-5 S Con Res 80	Defense Spending	21-70	4-31	17-39
78-6 S Con Res 80	Defense Spending	21-74	17-17	4-57
78-7 S 2493	Airline Deregulation	69-23	28-6	41-17
78-8 HR 8309	Waterway User Fees/ Water Projects	43-47	16-19	27-28
78-9 H J Res 554	D.C. Voting Rights	67-32	19-19	48-13
78-10 H J Res 638	Equal Rights Amendment	44-54	24-13	20-41
78-11 HR 5285	Hospital Cost Control	42-47	25-6	17-41
78-12 S 1753	Court-Ordered Busing	49-47	12-26	37-21
78-13 HR 6782	Emergency Farm Aid	67-26	26-11	41-15
78-14 HR 13511	Senate Tax Bill	52-43	13-23	39-20
78-15 HR 8410	Labor Law Reform	58-41	14-24	44-17

Source: Congressional Quarterly. Congressional Quarterly Weekly Report (1978)

Table 3-4

Pearson's P_λ Test for 15 Regressions

Variable	TEST C	TEST D
intercept	87.3291[a]	40.6761[c]
INC	69.2404[a]	36.0687
OLD	162.0235[a]	52.5918[a]
URBAN	46.4117[b]	27.4636
UNION	59.8717[a]	22.6686
PARTY	158.2305[a]	62.2142[a]
EDU	53.9657[a]	44.1153[b]
UNI	44.9442[b]	33.0771
REG	33.0817	29.1514
RADA	215.1054[a]	69.8612[a]
RET	32.2917	41.3007[c]
RET*RADA	32.6223	41.2623[c]

a is significant at 1 percent level
b is significant at 5 percent level
c is significant at 10 percent level

CHAPTER 4
WHOM DOES A LEGISLATOR REPRESENT? AN ELECTORAL COALITION APPROACH

Introduction

Legislators' congressional roll-call voting behavior has been studied by a number of economists within the context of the principal-agent theory (Kau and Rubin, 1979; Silberman and Durden, 1976; Kalt and Zupan, 1984; Peltzman, 1984; Nelson and Silberberg, 1987). One common methodology widely used in the literature (except by Peltzman) is one in which the average characteristics of politicians' electoral districts are employed as proxies for the principals' characteristics. That is, the principal's characteristics are assumed to be those of the average citizen residing in the congressional district or state.

When one tries to explain senators' behavior, a problem immediately follows. With this methodology, it is possible to explain why senators from different states vote differently, but it is not possible to explain intrastate differences in voting. Two senators serving the same state in this approach have the same principal and, according to principal-agent theory, should have the same behavior. If a

senator's behavior is not well explained by the principal's characteristics, then he must be shirking and he should be punished by the principal. However, casual observation shows that many pairs of senators from the same state have distinctly different voting records; nevertheless, they are re-elected repeatedly.[1] This implies that at least one of the two senators is deviating from the principal's preferences, but the shirkers have been repeatedly rewarded re-election instead of being punished. Does the standard prediction of principal-agent theory not hold for political contracts, or is the measure of the principal's characteristics misleading?

The third essay of this dissertation attempts to solve this puzzle. A more sensible principal-agent model is constructed in which senators representing the same state are allowed to have different electoral constituencies. With this approach, the shirkers classified by the median voter approach could turn out to be faithful representatives

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[1]Many pairs of senators have distinctively different voting records (ideological rankings) rated by the various monitoring groups, such as Americans for Democratic Action (ADA) and AFL-CIO's COPE. For example, in the 1978 ADA ranking, nine pairs of senators representing the same states ideologically differed by more than 50 points. That means the senators voted differently on half of some of the most important roll call votes in the 1978 Senate.

in serving their own electoral constituency.[2] We measure the characteristics of senators' electoral coalitions and find empirical evidence that interstate and intrastate variances in ideological rankings are better explained by the characteristics of electoral coalitions than by average state characteristics.

The plan of this chapter is as follows. In section 2, the usual median voter version of the principal-agent model is presented and shortcomings of the model are discussed. In section 3, data sources and the definitions of variables used in the empirical work are explained.In section 4, an empirical study is carried out to test whether or not electoral coalitions exist. Next, two methods of identifying a politician's electoral coalition with grouped data are discussed and their empirical results are reported. In section 5, intrastate differences in senators' ideological rankings are explained in terms of the characteristics of electoral coalitions, political action committees' campaign contributions, and senators' party affiliation. Finally, a summary and conclusion are presented.

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[2]Of course, this attempt is not new. Peltzman (1984) also realized the same problem, but he did not attempt to identify the characteristics of the principal. See section 3 for more detail.

The Median Voter Approach to the Principal-Agent Model: A Review

In the literature on representative democracies, two conflicting approaches have been widely used to explain the relationship between constituents and their representatives. One is the so-called median voter theory, which was originally introduced by Hotelling and has been frequently applied to the economic theory of politicians since the seminal work of Anthony Downs (1957). The other is the special interest group theory, which was initially developed by a number of Chicago economists led by Stigler and Peltzman in the effort to identify the pros and cons of government regulations.

The median voter theory was the dominant theory until the beginning of the 1970s for explaining the behavior of representatives both campaigning and in office. In this model, a politician must represent the median voter's interests in order to win elections and re-elections. Several predictions have been drawn from the median voter theory. First, in the two party democratic election system, candidates' platforms should converge towards the median voter's preferences. Second, if the distribution of voters' preference is normal, then voters located at both extreme positions have negligible political power in influencing politicians. Third, voters close to the

median voter tend to abstain from voting because they know that their interests will be represented no matter who is elected.[3]

On the other hand, the special interest group theory opposes the former view of impotent extremes. This theory, borrowing Peltzman's expression, is ultimately a theory of the optimum size of effective political coalitions set within the framework of a general model of the political process (Peltzman, 1976). A key prediction of this theory is that small groups often dominate the political process. Therefore, if we consider voters' preferences to be distributed univariate normal, then the voters located at both extremes could be more powerful than the median voter. This possibility contradicts the prediction of the median voter theory.

Despite the theoretical disputes, the median voter version of principal-agent model has been widely used to test congressional roll-call voting behavior (Silberman and Durden, 1976; Nelson and Silberberg, 1987). The empirical models used in the studies were typically represented as follows.

(4-1) $y = M X + Q I + u,$

[3]The pure Downsian theory even predicts that no one would vote because the candidates pick the same platform.

where, y is a binary variable corresponding to yes or no vote on a bill, X is a vector of the constituents' average socioeconomic characteristics, I is a politician's ideological ranking rated by a monitoring group such as Americans for Democratic Action, and M and Q are regression coefficients.

A more sophisticated version of this model recognized that there may be electoral competition on ideology, which makes ideology endogenous (Kau and Rubin, 1979; Kalt and Zupan, 1984; Kalt and Zupan, 1987). Therefore, a senator's ideological ranking can be a function of the characteristic variables.

$$(4\text{-}2) \quad I = \pi Z + \epsilon,$$

where Z is the vector of the constituency's average characteristics, π is the vector of corresponding parameters, and ϵ is the error term with mean zero. Pure ideology, which is orthogonal to Z, is written as:

$$(4\text{-}3) \quad PI = I - \hat{\pi} Z ,$$

where PI is the politician's pure ideology. Researchers then estimated equation 4-1 by substituting the new shirking measure PI for I. Interestingly, they found that PI was

still a significant factor in explaining roll-call voting outcomes.

Upon finding the evidence of ideological voting in Congress, scholars were confronted with the task of interpreting ideology. Is personal ideology political shirking or is it a political investment? Peltzman (1984) found that politicians' ideology was not a significant determinant of voting issues such as wealth redistribution but was a significant one on social issues such as abortion and school prayer. On the other hand, Kalt and Zupan (1984) studied a narrowly defined economic issue (the Surface Mining Control and Reclamation Act) and found ideological voting to be significant. In addition they found that politicians consumed more ideological voting when they have more committee power, a greater brand name (i.e., longer tenure in office), and a more heterogeneous electorate (Kalt and Zupan, 1987). Nelson and Silberberg (1987) also studied a narrowly defined economic issue (defense bills) and found that the role of ideology in senatorial voting was significant on general defense bills and not significant on specific defense bills, which are more closely monitored.

To summarize their findings, when politicians' behavior is closely monitored or when politicians have weak political power, personal ideology played no role in voting behavior, but when their behavior is not closely monitored or when

they are powerful, then personal ideology begins to play an important role in legislative decision making. Therefore, they concluded that there is some political shirking, and that it follows the law of demand.

However, as we can see in Table 4-1, many pairs of senators, sharing the same nominal constituency, have distinctly different voting records. That means that at least one of the two senators deviates from the median voter's preferences. Yet most of these "shirkers" have consistently been re-elected. If we believe the electoral process is a system to punish or reward an officeholder based on fulfillment of a political contract, then we can hardly believe a shirker will be re-elected consistently.

This puzzle can be solved if each senator has his own winning electoral coalition; if the two coalitions have conflicting interests, two senators should behave differently. To take one example, a winning coalition can be drawn from the upper half of the income distribution or the lower half of the income distribution. Legislators representing these two coalitions clearly will behave differently when they are voting on wealth redistribution issues.

Data and Variables

Senate Popular Election Returns

County level general election data for 1978 through 1982 were obtained from the National Election Data File of the Inter-university Consortium for Political and Social Research (ICPSR hereafter) at the University of Michigan. Four states had missing data in the 1978 general election file. Those were Alabama, Minnesota, Florida and Louisiana. The missing data were replaced by the 1984 returns.

County Mean and Median Characteristics

County level economic and social characteristics were obtained from Bureau of the Census' County and City Data Book (1983). The definition of selected variables used in the empirical work are as follows.

BLACK	the fraction of black population in 1980
EDU	the fraction of persons 25 years old and over in 1980 who have completed 4 years of high school or more
FEMWORK	the fraction of female workers in the civilian labor force in 1980

GOVEMP	the ratio of the employed persons in the government sector to the civilian labor force in 1980
INC	the natural log of the median household income in 1979
MANF	the fraction of the civilian labor force in 1980 which was in manufacturing
OLD	the fraction of elderly population (65 years old and over) in 1980
POPAREA	population per square mile in 1980
UNE	the fraction of unemployed persons in the civilian labor force in 1980
URBAN	the fraction of urban population in 1980

Campaign Contributions from PACs

PACs' campaign contribution data for 1977 through 1982 were obtained from the Federal Election Commission's Campaign Expenditures in the United States. Political action committees were grouped into six categories: corporate PAC (CORP), labor PAC (LABOR), trade/membership/health organization PAC (TMH), non-connected organization PAC (NONCON), cooperatives (COOP) and corporation without stock (NOSTK).

Ideological Ranking

Each year Americans for Democratic Action rates senators' ideological ranking based on their records on 20 selected roll-call votes. The score ranges from 0 to 100. The more liberal a senator is, the higher the score he receives. The ADA ranking data were obtained from various issues of the Congressional Quarterly Weekly Report (1983, 1984).

Identification of Electoral Coalitions

A Test of the Existence of Electoral Coalitions

Before identifying the characteristics of a senator's constituency, we first tested our assumption that senators from the same state have different electoral coalitions. Suppose senators A and B receive the shares S_a and S_b, respectively, of the vote in some county of their state. Examining the share differences with respect to potential coalition variables reveals which group favors the senator. Eight economic variables were selected to capture possible political coalitions. These are URBAN, BLACK, OLD, EDU, INC, UNE, MANF, and GOVEMP, which were defined above. If both senators have different coalitions with respect to a characteristic, say, income, the estimated coefficient on

INC of the following regression would be significant regardless of the sign. The sign of a coefficient only tells who is more favored among the constituents with that characteristic. The estimated regression is shown below:

(4-4) $S_a - S_b = f(\text{URBAN, BLACK, OLD, EDU, INC, UNE, MANF, GOVEMP})$,

where $S_a - S_b$ is the share difference.

Table 4-2 shows the estimated results. In most states, the senators' share differences were well explained by the selected variables. EDU, INC, and OLD were the most significant variables, and MANF and GOVEMP were the least significant variables. EDU was significant (10% level) in 17 states, INC in 16 states, and OLD in 15 states. On the other hand, MANF was significant only in 7 states and GOVEMP in only 9 states. These results strongly support our hypothesis that each incumbent has a different electoral coalition. In the next section, I will try to identify the characteristics of electoral coalitions for each senator.

Peltzman's Study

To my knowledge, Peltzman (1984) was the first to point out the misspecification of the usual empirical model.[4] One of the important arguments that Peltzman made in his paper is that a legislator is not only concerned with voters who supported him in the last election, but also with the marginal voter (the one who was indifferent as to the candidates). Since the marginal voter's characteristics are closer to the opponent, the differences in characteristics of supporters and opponents should be included in explaining legislative decision making, for example, in equation 4-1. He also argued that the presence of differences in characteristics in equation 4-1 would reduce the large explanatory power of the ideology measure, I.

Nonetheless, Peltzman's empirical model was different from his theory. Consider Peltzman's empirical model.

$$(4\text{-}5) \qquad y = d_1 M_1 + d_2 M_2 + d_3 M_3 + c_2 I_2$$

[4]"The usual procedure in modeling legislators as agents has been to treat all the residents of a legislator's district as his principal. . . . However, voters do not vote randomly. Competing candidates attract voters with systematically different incomes, education, and so on. *A sensible principal-agent model would allow the agent to be sensitive to these differences in the characteristics of those who voted for him and those who did not.*" (Peltzman; 1984, p. 184)

According to his theory, M_1 is a vector of supporters' characteristics, and M_2 is a vector of the differences in characteristics between supporters and opponents, and M_3 is a vector of characteristics of the legislator's campaign contributors. However, Peltzman used the state average characteristics for M_1, and the difference between the characteristics of those who voted for the legislator and the state average for M_2.

Even then, his method to deduce the M_2 was not free from criticism. He ran a regression of the following form with county data in order to estimate how the legislator's vote share as related to the characteristics of a county's residents.

(4-6) $S = a\ M,$

where S is a logit of the senator's share of the vote in a county of his state (i.e., the log of the ratio of his votes to his opponent's votes); M is a vector of economic characteristics of county residents; and a is a vector of coefficients. Peltzman used the results of this regression to calculate the differences between average state characteristics and the senator's supporters' characteristics. Because he got unrealistic estimates when he used the regresssion coefficients, he crudely adjusted the data taking into account the standard deviation of the

variable and whether the variable was significantly negative, significantly positive, or insignificant.[5] Peltzman's method also does not take into account systematic differences in voter turnout. Elected officials have no incentive to respond to the preferences of individuals who do not participate in the political process.

Identification of electoral coalitions' characteristics

In the following section, I illustrate some methods that can be used for deriving characteristics of a senator's electoral coalition (supporters). Theoretically, the candidate selection process is a two stage sequential decision. Election turnout depends upon voters' net benefits from voting. One would vote only if the benefit exceeds the cost. Once the voting decision is made, the voter then selects a candidate based on which one would bring more benefits to him. Therefore, the probability that a group of people who share common characteristics votes for a senator can be estimated by the following sequential probit estimation.

(4-7) $P_1 = F(\beta_1 X)$ and

$P_2 = (1 - F(\beta_1 X))F(\beta_2 X)$,

[5]See footnote 12 on page 190 of Peltzman (1984).

where P_1 is the probability of not voting, P_2 is the probability a voter will select, say, a Republican senator, and X is a vector of characteristics. β_1 can be estimated by dividing the whole sample into two groups, voters and nonvoters, and β_2 can be estimated using the subgroups of those who vote Republican and those who vote Democratic. However, the sequentially ordered probit estimation is not applicable if we do not have micro data.

This study requires good, heterogeneous data from each state. None of the survey-based micro data sets has a large enough sample in many states to be usable. County data are most suitable for this study. County level general election data have been compiled by the Inter-University Consortium for Political and Social Research Library (ICPSR hereafter), and county level economic and demographic data are available from the Census Bureau.

The first method of identifying the supporters' characteristics, using the county level data, is a weighted mean method. Each county's mean characteristics are weighted by a senator's votes in the county when calculating the state's weighted means, which describe the characteristics of the senator's supporters. For example, the mean income for senator A's supporters is obtained by

$$(4\text{-}8) \qquad WINC_A = \frac{\Sigma\ N_{Ai}\ INC_i}{\Sigma\ N_{Ai}},$$

where N_{Ai} is the number in county i voting for senator A, and INC_i is county i's median income. Clearly, both incumbent senators have different weighted means unless they have exactly the same number of votes in each county.

Table 4-3 reports the weighted mean characteristics for 97 senators in the 1983-1984 Senate. The numbers in the parentheses are the critical values constructed by the following.

$$C = \frac{|\mu_A - \mu_c|}{\sigma}, \tag{4-9}$$

where μ_A is the mean characteristic weighted by senator A's votes and μ_C is the state mean, and σ is the standard error of the state mean.

I also constructed statistics illustrating how both senators differed in terms of characteristics. The index variable Z is represented as follows.

$$Z = \frac{|\mu_A - \mu_B|}{\sigma}, \tag{4-10}$$

where μ_A is the mean characteristic weighted by senator A's votes and μ_B is the mean weighted by senator B's votes, and σ is the standard error of the state mean in equation 4-9. The minimum value and maximum value of Z are 0.5 and 1, respectively.

Table 4-4 shows the number of states in each of five categories of Z. In states with a high Z value, the two senators have greatly different constituencies. In fact, if Z is greater than 0.9, there is an 80 percent probability that the means are different. Significant differences between senators' constituencies are most common in education, income, and race. EDU and INC have the largest numbers of states with Z values over 0.9 (six each), followed by BLACK with five. Apparently, there is little difference in sectoral employment between constituencies. GOVEMP has the smallest number of states with high Z values, zero, followed by MANF with 2.

An alternative estimation procedure for identifying a candidate's electoral coalition is to utilize the minimum chi-square method. In this procedure, the probabilities of voting for the Republican candidate and for the Democratic candidate and of not voting are assumed to be associated with county level characteristics. Suppose a candidate's electorate has T counties and county t has N_t eligible voters. The observed probabilities with respect to voters' decisions are written as:

$$(4\text{-}11) \qquad \hat{P}_{it} = \frac{m_{it}}{N_t} \qquad (i=1,\ 2,\ 3 \text{ and } t=1,2,\ldots,T),$$

where m_{1t} is the number of eligible voters voting for the Democratic candidate, m_{2t} is the number voting Republican, and m_{3t} is the number abstaining from voting in county t.

If we assume the theoretical probabilities to be

$$(4\text{-}12) \qquad L_{it}^{*} = \log \frac{P_{it}}{1 - P_{it}} = \beta x_{it},$$

where i=1,2,3 and t=1,2,...,T. Then we can write the observed probabilities, L_{it}, as follows.

$$(4\text{-}13) \qquad L_{it} = \log \frac{\hat{P}_{it}}{1 - \hat{P}_{it}} = \beta x_{it} + u_{it},$$

where $u_{it} = L_{it}^{*} - L_{it}$. Using a Taylor-series expansion of L_{it} around P_i we get the approximated residual term,

$$(4\text{-}14) \qquad u_{it} = \frac{\hat{P}_{it} - P_{it}}{P_{it}(1 - P_{it})}$$

We can estimate the parameters by stacking the equation to form a combined regression model,

$$(4\text{-}15) \qquad \begin{bmatrix} L_1 \\ L_2 \\ L_3 \end{bmatrix} = \begin{bmatrix} X_1 & 0 & 0 \\ 0 & X_2 & 0 \\ 0 & 0 & X_3 \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ u_3 \end{bmatrix},$$

where L_i is the vector of T observations on variable i. After getting the covariance matrix of u_{it}, the Aiken generalized least-squares method is applied to estimate the parameters (Maddala, 1983).

The empirical model for equation 4-15 is

(4-16) L_{Dem} = f(URBAN, BLACK, OLD, EDU, INC, UNE, MANF, GOVEMP)

L_{Rep} = f(URBAN, BLACK, OLD, EDU, INC, UNE, MANF, GOVEMP)

L_{Abs} = f(URBAN, BLACK, OLD, EDU, INC, UNE, MANF, GOVEMP, FEMWORK, POPAREA)

where L_{Dem} is the logit of the Democratic candidate's share of the vote in a county, L_{Rep} is that of the Republican, and L_{Abs} that of abstainers. FEM is the percentage of female workers in 1980, and AREA is the population density of the county in 1980. FEMWORK and POPAREA were included in estimating the first step of voting decision because these two variables capture the cost of voting.

Four states with small counties were deleted from the sample: these were Connecticut (8 counties), Rhode Island (5 counties), Delaware (3 counties) and Hawaii (5 counties). Alaska was also deleted from the sample because election return data were not available by county.

The minimum chi-square results are reported in Table 4-5. In most states, the regressions show evidence of different electoral coalitions for each candidate. For

example, in the 1980 election, the Republican candidate of Alabama had supporters from the counties that were less urbanized and had more blacks, more aged people, fewer educated, and more government employees, while the Democratic candidate had supporters from the counties which were less urbanized and had more educated residents, more unemployed residents, fewer manufacturing employees, and fewer government employees.

These minimum chi-square results are then utilized to calculate the mean characteristics of each senator's constituency. A candidate's electoral coalition can be deduced by interpreting the sign and significance of the coefficients of equation. For example, if the Republican's share of vote has a positively significant coefficient on the income variable, then we could say that the rich favor the Republican candidate. If a variable was positively (negatively) significant at the 10 percent level, then the mean value of the variable's fourth (first) quartile was considered the characteristic mean of the senator's electoral coalition. If the variable was not significant then the state's population weighted average value was assigned to the coalition.

Ideological Ranking Differences: A Performance Test of The Characteristics of Electoral Coalitions

In the representative democracy, it is very costly for a constituency to monitor its legislator's behavior closely. The constituency's ignorance not only provides an environment for the legislator to enjoy on-the-job consumption but it also means that he must advertise what he has done for the constituency in his office at every re-election. However, as Weingast (1984) argued, constituents are eventually informed of the legislator's behavior by various monitoring groups. If a politician's ideology serves as a cheap information source by which his constituency evaluates his job performance, it would be chosen in order not to hurt him in re-election. To put it differently, a politician should have an acceptable ideological ranking by his electoral coalitions' standard.

In this section, senators' ideological rankings are explained by using the electoral coalitions' characteristics. Two other factors are also included in the analysis: campaign contributions from political action committees (PACs) and senators' political party affiliation. Statistics (Table 4-6) show that PACs are a prospering business in the political arena. Simply put, PACs buy influence from politicians with campaign contributions. PACs contribute campaign money either to protect their

narrowly defined interest or simply to seek access to Congress for the future. A politician in turn receives PAC money for the purpose of creating or keeping the winning coalitions (entry barrier to challengers) or transferring the entire amount to his own bank account when he leaves Congress. In any event, the success of PACs imposes huge costs on the rest of population.

In the previous section, we focussed on methods of identifying characteristics of a senator's electoral coalition with the hope that it would better explain the senator's behavior. However, the existence of campaign contributions may impede our effort to explain the senator's behavior in terms of political coalition theory, even if we succeed in finding the electoral principal. If a PAC has to buy influence from Congress in exchange for campaign contributions, it approaches those incumbents who have shown their policy positions to be closer to that of the PAC. Typically, PACs' positions on issues are announced before the senatorial roll-call voting. Therefore those who need campaign contributions from the specific special interest group can adjust their voting records if necessary.

There are two factors which stimulate politicians to deviate from the positions of their electoral coalitions toward the positions of special interest groups in return for campaign contributions. First, unlike the agent of a private organization, a politician can play a positive role

in forming the political coalition. While proposing various platforms along with negative campaign advertising, a politician can affect the formation of his electoral coalition; managers of a private firm cannot recruit shareholders. Second, the electoral coalition is not as effective in monitoring its agent as the owners of a private firm. Large stockholders of private firms have a great incentive to make the company more profitable. Managers of private firms also have a strong incentive to prevent the firm from becoming a takeover target. However, managers of political firms do not face a similar incentive to control costs since they cannot personally recoup any cost saving. The means available to voters to limit shirking by political managers are minimal and costly to implement (McCormick and Tollison, 1981).

The final factor which has strong influence in forming a politician's ideological ranking is his party. Various views of "party" have been proposed in the literature. A political party may be considered merely an ideological marker (Kau and Rubin, 1979), a special interest group that provides internal campaign contributions (Peltzman, 1984), or a bargaining agent for groups of lawmakers in their dealings with interest groups (Lindsay and Maloney, 1988). In any event, these views predict a stable coalition among the members of a party.

Therefore a senator's ideological ranking would be modeled as a function of the characteristics of his electoral coalition, his political party affiliation, and the characteristics of the campaign contributors. That is,

$$(4\text{-}17) \qquad I_i = f\ (X_i,\ PAC_i,\ PARTY_i),$$

where I_i is senator i's ideological ranking, X_i is the supporters' characteristics, $PARTY_i$ is his party affiliation, and PAC_i is the characteristics of PACs that contribute campaign money to the senator.

Tables 4-7 and 4-8 report the regression results. The dependent variable was the average of 1983 and 1984 ADA rankings. In Table 4-7, constituents' characteristics are the only explanatory variables. I intentionally deleted the other two arguments in order to compare the explanatory power of the different measures of constituent characteristics. Test 1 used the state average characteristics (SAC hereafter), Test 2 used the weighted mean characteristics (WMC hereafter) and Test 3 used the derived characteristics from the minimum chi-square regressions (DCM hereafter) as explanatory variables. Unions are an important interest group. A state's unionization ratio (UNION), reported in the Statistical Abstract of the United States, was included in all three

tests because county level unionization data were not available.

The regression results clearly show that senators' ideological rankings can be better explained by electoral coalitions' characteristics (Tests 2 and 3) than by the median voter's characteristics (Test 1). Furthermore, the DCM characteristics perform best in explaining ADA rankings; the R^2 was .11 higher than in the SAC regression, an improvement of almost 40 percent. The DCM regresssion also had the largest number of significant variables.

In Table 4-8, I add party, campaign contributions, and some southern variables. Tests 4, 5, and 6 are the counterparts of Tests 1, 2, and 3 in Table 4-7.

Campaign contributions are grouped into six categories by the Federal Election Commission: corporate contributions (CORP), labor contributions (LABOR), non-connected organization contributions (NONCON), trade/membership/ health organization contributions (TMH), cooperative contributions (COOP) and corporation without stock contributions (NOSTK). As can be seen in Table 4-9, PAC contributions grew dramatically between 1978 and 1982. My measure of PAC contibutions sums contributions for 1978, 1980, and 1982, deflating in each year by the mean contributions in that year in order to avoid putting heavy weight on recent elections. Thus, a senator who received $72,137 from corporate PACs in 1978 is equally treated with

a senator who received $188,768 from corporate PACs in 1982.

I also created a south dummy and a dummy interaction between SOUTH and BLACK. These dummy variables were created to see if southern conservatism is really a reflection of southern specific ideology. Alternatively, southern conservatism may reflect constituent characteristics, particularly the race variable (BLACK). The Blacks living in northern industrial areas are more politically organized than those living in the South.

Surprisingly, the three sets of characteristics show no difference in R^2. This may be because the variances of ADA are dominated by the variances of party and campaign contributions made by labor unions. Again DCM characteristics (Test 6) showed the best result in terms of the number of significant coefficients. The urbanization ratio, unemployment rate, labor union contributions, and party were significant in the SAC regression (Test 4). The unemployment rate, labor unions contributions, and party were significant in the WMC regression (Test 5). However, the urbanization ratio, black population, elderly population, labor contributions, party, and southern black were all significant in the DCM regression.

The party and labor contribution variables were the only variables which were significant in all three regressions. On the average, the Democrats have higher ADA rankings than the Republicans by approximately 25 percentage

points. A unit increase in normalized labor PAC contributions (LABOR) increased the ADA ranking by approximately 9 percentage points. This variable overwhelms the fraction of the state labor force that is unionized (UNION). UNION is insignificant in Table 4-8 but was significant in Table 4-7, which did not include the contribution variables.

Several other variables were significant in some regresssions. Senators with more supporters from urban areas and areas with high unemployment were more liberal. So were senators with more supporters among the elderly. BLACK and SOUBLA were significant only in the DCM regression, where the SOUTH dummy was insignificant. These results imply that a northern senator with more black supporters is more liberal. In contrast, a southern senator with more black supporters is no more liberal. These results are consistent with the fact that southern blacks have been less active politically than northern blacks. Being from the South is associated with being more conservative only if the senator has a sufficiently large number of black supporters. Perhaps this reflects the fact that senators from Deep South states are more conservative than other southern senators.

The senators' ADA rankings were not significantly related to household income, educational attainment, the

size of the manufacturing sector or of the government sector, or to non-labor contributions.

Finally, we attempted to explain why many pairs of senators from the same states have different ideology rankings. We hypothesized that the differences could be explained by the differences in electoral coalitions, party affiliation, and PACs' campaign contributions. The dependent variable was the ADA difference between the two senators of a state, and the explanatory variables were the differences in characteristics between the electoral coalitions, PACs' contributions, and party affiliations.[6] That is,

$$(4\text{-}18) \qquad ADA_a - ADA_b = f(X_a - X_b,\ PAC_a - PAC_b,\ PARTY_a - PARTY_b)$$

In each state, the lower ADA score was subtracted from the higher ADA score. In states with different parties, this amounts to subtracting the Republican ADA ranking from the Democratic ADA ranking.[7]

To estimate the party effect on the ideological ranking difference between the two senators, a dummy variable was created and was included in the regression. That is,

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[6]The DCM constituency measures, which were derived from the minimum chi-square regressions, are used.

[7]In our sample, no Republican had higher ADA rankings than the Democrat within a state.

(4-19) DP = 1 when two senators were from different parties

= 0 otherwise

As we have seen in Table 4-8, the Democratic senators have high ADA rankings and ADA rankings are positively related to labor PACs' campaign contributions. This suggests a possible correlation between campaign contributions and the party variable. To control the interaction between the party difference and campaign money sources, the dummy interaction terms between DP and CORP (DPCORP), DP and LABOR (DPLABOR), DP and COOP (DPCOOP), DP and NONCON (DPNONCON), DP and TMH (DPTMH), and DP and NOSTK (DPNOSTK) were created.

Equation 4-17 was first estimated by the ordinary least square (OLS) method. The first column of Table 4-10 reports the OLS regression. URBAN, LABOR, and DP*TMH and DP were the only significant variables. Senators with a more urban constituency and who received more money from labor PACs than the other senator from the state are more liberal. Also the Democratic senator has higher ADA ranking than the Republican by 31 points. Senators who receive contributions from trade, membership, or health organization PACs are more conservative.

The second column of Table 4-10 is the regression result by the logit method. Since the ADA ranking

differences are bounded between 0 and 100, the log-odds model would be a better estimation technique (Maddala, 1983). The regression result supported this conjecture. Seven variables are significant at the five percent level, and two variables are significant at the ten percent level.

The only constituent characteristic that was significantly related to the differences in ADA rankings was OLD. A senator representing a more elderly population than his colleague from the same state is more liberal. Differences in urbanization are not significant in this specification.

PACs' contributions are more powerful explanatory variables in this specification than before. When both senators represented the same party (DP=0), the senator receiving larger contributions from corporate PACs is found to have a lower ADA score. The contributions may be influencing senators to vote more conservatively. A senator receiving more campaign contributions from non-connected organizations had higher ADA rankings than the other, even though they represented the same party.

When both senators were affiliated with different parties, the senator receiving more campaign money from corporate and labor PACs and less money from cooperative and non-connected PACs had a more liberal voting record.

Also the party difference was the most significant factor for forming the ideology difference within a state.

To summarize, the ideological differences between the two senators within a state were well explained by combining campaign contributions, party affiliations, and the electoral coalitions' characteristics. One final note must be made for further research. Campaign contributions are endogenous. If the system could be identified, the simultaneous probit or logit model would be an appropriate method.

Summary and Conclusion

In this paper, I attempted to build a principal-agent model using the electoral coalition approach. This approach was inevitable, since the usual median voter version of the principal-agent model could not solve the paradox of many pairs of senators from the same states consistently behaving differently and yet being repeatedly re-elected. I showed the existence of different electoral coalitions for each senator within a state. Characteristics of a senator's political coalition were obtained from county data by using the minimum chi-square method and the weighted mean method.

A senator's behavior may not be fully controlled by his electoral principals simply because it is too costly for them to monitor him. The possibility of shirking begins

there. This helps to explain how special interest groups are able to influence voting through their campaign contributions.

I attempted to explain the intrastate variances of senators' ideological rankings as well as interstate variances. The empirical results showed the electoral coalition's characteristics were better than the median voter's characteristics. However, political action committees' campaign contributions were the most powerful explanatory variables apart from party. I also acknowledged the possible misspecification of the empirical model and the need for further research using a simultaneous equation model.

Table 4-1
Senators' ADA Rankings

ST	NAME	ADA	ST	NAME	ADA	ST	NAME	ADA
AK	MURKOW	5.0	MA	KENNED	85.0	NY	DAMAT	22.5
AK	STEVEN	17.5	MA	TSONGA	85.0	NY	MOYNIH	82.5
AL	DENTON	2.5	MD	MATHIA	57.5	OH	GLENN	65.0
AL	HEFLIN	30.0	MD	SARBAN	97.5	OH	METZEN	100.0
AR	BUMPER	75.0	ME	COHEN	62.5	OK	BOREN	45.0
AR	PRYOR	62.5	ME	MITCHE	85.0	OK	NICKLE	5.0
AZ	DECONC	52.5	MI	LEVIN	97.5	OR	HATFIE	67.5
AZ	GOLDWA	7.5	MI	RIEGLE	92.5	OR	PACKWO	45.0
CA	CRANST	85.0	MN	BOSCHW	37.5	PA	HEINZ	42.5
CA	WILSON	12.5	MN	DURENB	45.0	PA	SPECTE	65.0
CO	ARMSTR	7.5	MO	DANFOR	37.5	SC	HOLLIN	65.0
CO	HART	70.0	MO	EAGLET	85.0	SC	THURMO	2.5
FL	CHILES	65.0	MS	COCHRA	15.0	SD	ABDNOR	10.0
FL	HAWKIN	25.0	MS	STENNI	35.0	SD	PRESSL	32.5
GA	MATTIN	12.5	MT	BAUCUS	75.0	TN	BAKER	20.0
GA	NUNN	37.5	MT	MELCHE	85.0	TN	SASSER	82.5
IA	GRASSL	15.0	NC	EAST	0.0	TX	BENTSE	47.5
IA	JEPSEN	12.5	NC	HELMS	0.0	TX	TOWER	12.5
ID	MCCLUR	0.0	ND	ANDREW	47.5	UT	GARN	2.5
ID	SYMMS	0.0	ND	BURDIC	87.5	UT	HATCH	5.0
IL	DIXON	65.0	NE	EXON	47.5	VA	TRIBLE	12.5
IL	PERCY	45.0	NE	ZORINS	12.5	VA	WARNER	15.0
IN	LUGAR	12.5	NH	HUMPHR	15.0	WI	KASTEN	12.5
IN	QUAYLE	17.5	NH	RUDMAN	27.5	WI	PROXMI	62.5
KS	DOLE	7.5	NJ	BRADLE	85.0	WV	BYRD	70.0
KS	KASSEB	40.0	NJ	LAUTEN	92.5	WV	RANDOL	60.0
KY	FORD	75.0	NM	BINGAM	95.0	WY	SIMPSO	22.5
KY	HUDDLE	60.0	NM	DOMENI	20.0	WY	WALLOP	5.0
LA	JOHNST	37.5	NV	HECHT	0.0			
LA	LONG	30.0	NV	LEXALT	5.0			

Note: ADA=the mean of the 1983 and 1984 ADA rankings
Source: Congressional Quarterly. Congressional Quarterly Weekly Report (1983,1984)

Table 4-2
Share Differences of Two Incumbents by State

ST	intercept	URBAN	BLACK	OLD	INC	EDU	UNE	MANF	GOVEMP	R^2
AL	1.6806[c]	-0.0166	-0.2957[a]	-0.4696	-0.1636	0.4362	-1.8922[a]	-0.2298[c]	-0.6232[a]	0.69
AZ	6.3345	0.0031	0.8915	-0.7920	-0.6873	0.6872	0.0357	0.1107	-0.7656	0.70
AR	-1.2740[b]	-0.0288	0.0212	0.3368[c]	0.1392[b]	-0.1658	-0.0374	-0.1274	0.2481	0.10
CA	-0.4088	0.0845[b]	0.7984[a]	0.1042	0.0225	0.0967	0.2906	0.0474	0.0031	0.48
CO	1.3073	0.1680[b]	0.9232	-1.4384[c]	-0.1085	-0.5129	0.6949	-0.4974	0.1610	0.29
GA	2.2300[a]	0.0066	-0.0387	-0.5935[b]	-0.2211[a]	-0.3662[a]	-0.1655	0.0577	0.1126	0.57
ID	-1.1183	-0.0268	2.0140	0.6317[c]	0.1125	-0.1775	-0.0757	0.0903	-0.0421	0.26
IL	1.2837[a]	0.0002	-0.0266	0.2474	-0.1593[a]	0.4393[a]	-0.2565	0.1030	-0.2555[b]	0.37
IN	-0.0722	-0.0132	0.0190	-0.3504	0.0070	0.1562[b]	0.2543	-0.0592	-0.0590	0.21
IA	-1.2126	-0.0756	-1.0852	0.1695	0.1935	-0.7021[a]	-0.8830	-0.1295	-0.4789[b]	0.36
KS	1.1102[a]	0.0011	0.2775[b]	-0.0834	-0.1038[b]	-0.2040[b]	-0.6922[b]	-0.0427	-0.0673	0.30
KY	-4.8735[a]	-0.0826	0.5329	2.0018[a]	0.5067[a]	-0.3304	0.0936	-0.3261[c]	0.7323[b]	0.32
LA	1.4384	-0.0703	0.0238	-0.5255	-0.1793	0.5085	-1.0754	0.1626	-0.0788	0.05
ME	-2.5496	-0.0707	-6.8773[c]	-1.3005	0.3972	-1.3224[a]	-0.5738	-0.5508[b]	-0.5298	0.89
MD	1.2184	0.0296	-0.1427	0.0151	-0.1124	0.1453	-1.0593	-0.1723	-0.1774	0.25
MA	-3.2283	0.0141	0.4443	0.4678	0.2830	0.1418	1.9915[b]	0.4476	0.1471	0.92
MI	-0.0123	-0.0568[a]	-0.0222	-0.3224[b]	0.0182	-0.1853[b]	-0.1154	0.0993	-0.0869	0.48
MN	-0.9168[b]	0.0335[c]	0.3928	0.3966[b]	0.0908[b]	-0.1663	0.1334	-0.0921	0.0057	0.17
MS	-7.2123	0.8771[a]	-0.4748	2.6335	0.7150	-1.6507	4.1396	0.3248	1.9327	0.16
MO	0.0104	-0.0248	0.3888[b]	-0.2335	0.0232	-0.0771	-0.1426	-0.2524	-0.2220	0.10
MT	0.9683	-0.0368	2.7168	-0.1781	-0.0721	-0.3017[c]	-0.3257	-0.3156	-0.1592	0.50
NE	0.1917	-0.0794[b]	0.1823	0.1429	-0.0434	0.3760[b]	-0.4384	0.1216	0.0159	0.23
NV	4.2456[c]	0.1168[c]	-0.0972	0.5938	-0.4821[c]	0.5431	-0.0338	-0.2540	-0.0283	0.53
NH	0.0407	0.1950	-9.6480	-0.4731	-0.0120	0.3323	-0.1396	-0.5480	-0.2703	0.97
NJ	1.6564	0.0026	-0.0340	-0.0537	-0.1731	-0.0928	-0.2126	0.0465	-0.2010	0.85
NM	-1.3843	0.6567	1.5938	-2.9939	0.1111	-1.2844	2.7657	5.2079	1.2617	0.29
NY	-0.9918[b]	-0.1480[a]	-0.1173	-0.3742	0.1095[b]	-0.0139	1.1605[a]	0.0900	-0.2557	0.72
NC	1.0694[a]	0.0655[a]	-0.0490[a]	-0.0476	-0.1386[a]	0.1653[a]	0.0173	0.2185[a]	0.1220[c]	0.54
ND	0.3787	0.0128	0.0838	-0.5484[a]	-0.0516	0.0291	0.2974	-0.0655	-0.1267	0.24
OH	0.4570	0.0115	-0.0760	-0.5439[c]	-0.0245	0.0297	-0.3725[b]	-0.0835	-0.1056	0.19

Note: *a*, *b*, and *c* are significant at 1%, 5%, and 10% levels, respectively.

Table 4-2--Continued

ST	intercept	URBAN	BLACK	OLD	INC	EDU	UNE	MANF	GOVEMP	R^2
OK	0.0163	-0.0880[a]	0.0338	-0.1617	-0.0478	0.7382[a]	-0.6090	-0.1117	-0.3604[b]	0.67
OR	0.5975	-0.0238	0.4747	-0.5915	-0.0482	-0.2404	0.4727	-0.2646	0.1866	0.45
PA	1.8283[b]	-0.0531[c]	0.4237[a]	0.4823	-0.1994[b]	0.2866[b]	-1.5102[a]	0.0525	-0.1770	0.32
SC	0.5657	0.0350	0.2855[a]	-0.1264	-0.0602	-0.3479	0.3421	0.1913	0.0548	0.83
SD	-0.2097	0.0321	0.1491	-0.3089[c]	0.0517	-0.3709[a]	-0.2669	-0.4663[a]	-0.1629[b]	0.42
TN	0.6850[b]	0.0122	-0.0263	-0.5482[a]	-0.0828[b]	0.0105	0.5750[a]	0.1364[b]	0.1041	0.37
TX	1.4195[a]	0.0170	0.0735	-0.1034	-0.1300[b]	-0.7080[a]	1.0386[a]	0.1320	0.2479[c]	0.56
UT	-1.1693[c]	0.0760[b]	-1.2371	0.7230[c]	0.1097[c]	0.0989	0.4794	0.1204	0.0594	0.52
VT	-3.0210	0.0874	-9.4567	0.3366	0.3616	-0.5394	-0.0347	-0.3210	0.0990	0.57
VA	1.0642[b]	0.0050	0.0431	0.2405	-0.1458[a]	0.1760[c]	0.7159[b]	0.0076	0.0143	0.27
WA	3.0303[a]	-0.0526	-0.3837	-0.8765[b]	-0.3057[a]	0.4253[a]	-0.9228[a]	-0.3520[b]	-0.5700[a]	0.69
WV	-0.0912	-0.0280	-0.3282[b]	1.0577[a]	0.0083	0.0722	0.2945	-0.0461	0.0726	0.54
WI	-4.3360[b]	0.0062	-1.1684[c]	1.6408[c]	0.4758[b]	-0.5023[c]	-0.3721	-0.0830	-0.3179	0.34
WY	0.9785	0.0648	-0.0650	0.1489	-0.0735	-0.5083	0.4159	-0.5657	-0.3042	0.41

Table 4-3
Weighted Mean Characteristics of Senators' Electoral Coalitions

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
AK STEVEN	0.110	0.018	0.035	0.691	0.064	0.140	9.981	0.427
	(0.974)	(0.895)	(0.926)	(0.754)	(0.847)	(0.943)	(0.892)	(0.984)
AK MURKOW	0.094	0.019	0.034	0.688	0.059	0.143	9.977	0.434
	(0.985)	(0.939)	(0.972)	(0.787)	(0.902)	(0.971)	(0.881)	(0.993)
AL HEFLIN	0.353	0.320	0.129	0.484	0.302	0.082	9.343	0.178
	(0.835)	(0.946)	(0.922)	(0.818)	(0.509)	(0.814)	(0.947)	(0.660)
AL DENTON	0.387	0.260	0.124	0.500	0.300	0.078	9.404	0.171
	(0.581)	(0.767)	(0.649)	(0.772)	(0.575)	(0.824)	(0.819)	(0.758)
AR PRYOR	0.331	0.150	0.156	0.491	0.261	0.080	9.284	0.153
	(0.760)	(0.502)	(0.720)	(0.818)	(0.502)	(0.764)	(0.840)	(0.544)
AR BUMPER	0.331	0.155	0.156	0.493	0.262	0.079	9.291	0.155
	(0.760)	(0.606)	(0.720)	(0.747)	(0.559)	(0.624)	(0.734)	(0.682)
AZ GOLDWA	0.613	0.016	0.110	0.658	0.097	0.074	9.580	0.237
	(0.546)	(0.597)	(0.733)	(0.729)	(0.505)	(0.651)	(0.530)	(0.651)
AZ DECONC	0.603	0.016	0.103	0.647	0.103	0.075	9.591	0.242
	(0.537)	(0.597)	(0.531)	(0.537)	(0.643)	(0.579)	(0.637)	(0.567)
CA CRANST	0.583	0.030	0.116	0.734	0.119	0.092	9.695	0.198
	(0.544)	(0.511)	(0.634)	(0.761)	(0.515)	(0.586)	(0.587)	(0.624)
CA WILSON	0.537	0.024	0.118	0.733	0.115	0.094	9.680	0.200
	(0.887)	(0.892)	(0.800)	(0.731)	(0.695)	(0.597)	(0.687)	(0.729)
CO ARMSTR	0.254	0.004	0.107	0.738	0.063	0.052	9.597	0.191
	(0.929)	(0.815)	(0.768)	(0.563)	(0.796)	(0.714)	(0.784)	(0.588)
CO HART	0.298	0.006	0.102	0.740	0.068	0.055	9.610	0.192
	(0.660)	(0.509)	(0.545)	(0.506)	(0.523)	(0.652)	(0.653)	(0.641)
CT DODD	0.618	0.043	0.113	0.702	0.302	0.048	9.880	0.150
	(0.621)	(0.612)	(0.679)	(0.583)	(0.659)	(0.660)	(0.587)	(0.703)
CT WEICKE	0.624	0.044	0.114	0.704	0.303	0.047	9.887	0.147
	(0.656)	(0.648)	(0.608)	(0.529)	(0.621)	(0.524)	(0.505)	(0.592)

Note: critical values of the standardized normal distribution in parentheses.

Table 4-3--Continued

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
DE BIDEN	0.495	0.171	0.105	0.652	0.210	0.066	9.710	0.176
	(0.529)	(0.542)	(0.506)	(0.521)	(0.537)	(0.556)	(0.535)	(0.538)
DE ROTH	0.473	0.172	0.107	0.647	0.210	0.066	9.702	0.175
	(0.508)	(0.503)	(0.547)	(0.524)	(0.537)	(0.556)	(0.501)	(0.550)
FL HAWKIN	0.522	0.135	0.165	0.616	0.120	0.057	9.481	0.191
	(0.883)	(0.879)	(0.896)	(0.906)	(0.759)	(0.744)	(0.869)	(0.871)
GA NUNN	0.296	0.298	0.116	0.444	0.292	0.061	9.430	0.178
	(0.683)	(0.890)	(0.860)	(0.713)	(0.519)	(0.670)	(0.581)	(0.604)
GA MATTIN	0.324	0.248	0.110	0.468	0.286	0.060	9.480	0.174
	(0.802)	(0.992)	(0.946)	(0.994)	(0.810)	(0.872)	(0.998)	(0.760)
HI INOUYE	0.035	0.000	0.246	0.308	0.097	0.003	8.744	0.589
	(0.998)	(0.917)	(1.000)	(1.000)	(0.999)	(0.999)	(1.000)	(1.000)
HI MATSUN	0.032	0.000	0.247	0.306	0.097	0.002	8.736	0.592
	(0.998)	(0.917)	(1.000)	(1.000)	(0.999)	(0.999)	(1.000)	(1.000)
IA JEPSEN	0.358	0.004	0.160	0.684	0.165	0.050	9.623	0.136
	(0.796)	(0.556)	(0.745)	(0.735)	(0.651)	(0.617)	(0.734)	(0.699)
IA GRASSL	0.360	0.004	0.160	0.684	0.165	0.050	9.627	0.136
	(0.772)	(0.556)	(0.745)	(0.735)	(0.651)	(0.617)	(0.631)	(0.699)
ID MCCLUR	0.285	0.001	0.108	0.723	0.114	0.086	9.537	0.184
	(0.771)	(0.805)	(0.579)	(0.686)	(0.743)	(0.737)	(0.686)	(0.720)
ID SYMMS	0.291	0.001	0.108	0.721	0.117	0.088	9.540	0.180
	(0.723)	(0.805)	(0.579)	(0.615)	(0.617)	(0.649)	(0.635)	(0.560)
IL PERCY	0.403	0.028	0.145	0.619	0.208	0.084	9.683	0.143
	(0.870)	(0.670)	(0.759)	(0.674)	(0.623)	(0.631)	(0.662)	(0.574)
IL DIXON	0.419	0.032	0.146	0.615	0.205	0.086	9.673	0.145
	(0.689)	(0.587)	(0.846)	(0.830)	(0.762)	(0.850)	(0.821)	(0.578)
IN QUAYLE	0.376	0.015	0.118	0.644	0.299	0.079	9.715	0.125
	(0.659)	(0.724)	(0.559)	(0.687)	(0.541)	(0.612)	(0.647)	(0.565)

Table 4-3--Continued

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
IN LUGAR	0.370	0.015	0.119	0.643	0.299	0.079	9.711	0.125
	(0.744)	(0.724)	(0.725)	(0.633)	(0.541)	(0.612)	(0.541)	(0.565)
KS KASSEB	0.283	0.011	0.178	0.693	0.107	0.028	9.539	0.172
	(0.888)	(0.903)	(0.905)	(0.574)	(0.875)	(0.930)	(0.790)	(0.540)
KS DOLE	0.285	0.011	0.176	0.693	0.107	0.028	9.543	0.172
	(0.875)	(0.903)	(0.815)	(0.574)	(0.875)	(0.930)	(0.701)	(0.540)
KY HUDDLE	0.243	0.041	0.126	0.459	0.218	0.096	9.409	0.159
	(0.508)	(0.638)	(0.779)	(0.739)	(0.662)	(0.908)	(0.793)	(0.597)
KY FORD	0.245	0.041	0.126	0.462	0.217	0.098	9.415	0.159
	(0.543)	(0.638)	(0.779)	(0.828)	(0.614)	(0.760)	(0.864)	(0.597)
LA LONG	0.418	0.297	0.114	0.490	0.152	0.069	9.476	0.189
	(0.623)	(0.543)	(0.779)	(0.877)	(0.600)	(0.670)	(0.618)	(0.571)
MA TSONGA	0.699	0.029	0.137	0.735	0.223	0.054	9.736	0.165
	(0.614)	(0.558)	(0.593)	(0.549)	(0.632)	(0.534)	(0.606)	(0.578)
MA KENNED	0.656	0.028	0.141	0.744	0.209	0.053	9.727	0.165
	(0.612)	(0.587)	(0.604)	(0.600)	(0.579)	(0.569)	(0.517)	(0.578)
MD MATHIA	0.465	0.159	0.107	0.629	0.157	0.063	9.820	0.227
	(0.653)	(0.657)	(0.536)	(0.727)	(0.582)	(0.687)	(0.679)	(0.503)
MD SARBAN	0.456	0.171	0.107	0.622	0.156	0.065	9.809	0.228
	(0.604)	(0.518)	(0.536)	(0.617)	(0.611)	(0.524)	(0.600)	(0.525)
ME COHEN	0.340	0.002	0.133	0.685	0.267	0.086	9.473	0.161
	(0.650)	(0.680)	(0.699)	(0.642)	(0.558)	(0.505)	(0.558)	(0.510)
ME MITCHE	0.367	0.002	0.131	0.681	0.271	0.084	9.483	0.161
	(0.556)	(0.680)	(0.528)	(0.516)	(0.512)	(0.617)	(0.585)	(0.510)
MI LEVIN	0.304	0.025	0.131	0.654	0.215	0.130	9.596	0.177
	(0.622)	(0.590)	(0.915)	(0.778)	(0.849)	(0.851)	(0.878)	(0.707)
MI RIEGLE	0.307	0.027	0.129	0.654	0.220	0.129	9.609	0.174
	(0.583)	(0.541)	(0.816)	(0.778)	(0.693)	(0.785)	(0.743)	(0.553)
MN DURENB	0.324	0.002	0.147	0.644	0.159	0.070	9.585	0.156
	(0.654)	(0.618)	(0.569)	(0.584)	(0.664)	(0.779)	(0.603)	(0.621)

Table 4-3--Continued

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
MO EAGLET	0.293	0.031	0.169	0.570	0.197	0.072	9.408	0.143
	(0.515)	(0.800)	(0.755)	(0.510)	(0.659)	(0.704)	(0.516)	(0.575)
MO DANFOR	0.283	0.027	0.170	0.570	0.199	0.072	9.403	0.143
	(0.666)	(0.543)	(0.828)	(0.510)	(0.533)	(0.704)	(0.582)	(0.575)
MS COCHRA	0.284	0.371	0.129	0.495	0.262	0.077	9.295	0.187
	(0.517)	(0.617)	(0.687)	(0.706)	(0.578)	(0.716)	(0.608)	(0.550)
MS STENNI	0.248	0.394	0.131	0.480	0.263	0.081	9.264	0.189
	(0.923)	(0.801)	(0.901)	(0.879)	(0.616)	(0.836)	(0.888)	(0.605)
MT BAUCUS	0.226	0.001	0.125	0.706	0.044	0.062	9.529	0.209
	(0.629)	(0.553)	(0.630)	(0.612)	(0.600)	(0.646)	(0.607)	(0.540)
MT MELCHE	0.215	0.001	0.125	0.704	0.042	0.061	9.525	0.208
	(0.725)	(0.553)	(0.630)	(0.728)	(0.744)	(0.701)	(0.685)	(0.513)
NC HELMS	0.225	0.188	0.120	0.488	0.329	0.067	9.467	0.156
	(0.936)	(0.995)	(0.934)	(0.708)	(0.821)	(0.609)	(0.618)	(0.898)
NC EAST	0.250	0.184	0.118	0.493	0.334	0.064	9.483	0.154
	(0.692)	(0.998)	(0.766)	(0.525)	(0.912)	(0.834)	(0.773)	(0.949)
ND ANDREW	0.164	0.001	0.153	0.593	0.040	0.043	9.517	0.150
	(0.699)	(0.522)	(0.693)	(0.697)	(0.637)	(0.792)	(0.607)	(0.773)
ND BURDIC	0.166	0.001	0.152	0.599	0.041	0.045	9.523	0.155
	(0.681)	(0.522)	(0.629)	(0.501)	(0.567)	(0.618)	(0.506)	(0.564)
NE EXON	0.215	0.002	0.171	0.691	0.095	0.026	9.480	0.164
	(0.833)	(0.663)	(0.792)	(0.633)	(0.682)	(0.750)	(0.812)	(0.548)
NE ZORINS	0.215	0.002	0.171	0.691	0.096	0.026	9.481	0.165
	(0.833)	(0.663)	(0.792)	(0.633)	(0.624)	(0.750)	(0.796)	(0.545)
NH HUMPHR	0.409	0.003	0.128	0.712	0.278	0.057	9.655	0.152
	(0.704)	(0.528)	(0.725)	(0.562)	(0.674)	(0.560)	(0.631)	(0.543)
NH RUDMAN	0.411	0.003	0.127	0.715	0.277	0.057	9.660	0.152
	(0.693)	(0.528)	(0.672)	(0.628)	(0.690)	(0.560)	(0.579)	(0.543)
NJ BRADLE	0.794	0.107	0.120	0.669	0.228	0.071	9.862	0.165
	(0.639)	(0.572)	(0.580)	(0.592)	(0.543)	(0.552)	(0.595)	(0.556)

Table 4-3--Continued

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
NJ LAUTEN	0.798	0.109	0.120	0.666	0.227	0.072	9.857	0.165
	(0.669)	(0.614)	(0.580)	(0.659)	(0.569)	(0.629)	(0.640)	(0.556)
NM DOMENI	0.464	0.009	0.123	0.629	0.057	0.073	9.408	0.274
	(0.737)	(0.759)	(0.800)	(0.527)	(0.539)	(0.712)	(0.677)	(0.650)
NM BINGAM	0.307	0.004	0.160	0.580	0.040	0.076	9.257	0.266
	(1.000)	(0.995)	(1.000)	(0.999)	(0.995)	(0.523)	(1.000)	(0.529)
NV LAXALT	0.327	0.011	0.097	0.707	0.054	0.049	9.688	0.242
	(0.714)	(0.662)	(0.606)	(0.651)	(0.642)	(0.702)	(0.670)	(0.679)
NV HECHT	0.306	0.010	0.096	0.707	0.054	0.048	9.694	0.241
	(0.788)	(0.716)	(0.532)	(0.651)	(0.642)	(0.777)	(0.599)	(0.663)
NY DAMAT	0.446	0.030	0.125	0.667	0.231	0.086	9.667	0.193
	(0.906)	(0.940)	(0.645)	(0.549)	(0.697)	(0.817)	(0.555)	(0.689)
NY MOYNIH	0.506	0.042	0.125	0.668	0.225	0.083	9.676	0.193
	(0.617)	(0.551)	(0.645)	(0.608)	(0.558)	(0.508)	(0.599)	(0.689)
OH GLENN	0.454	0.033	0.111	0.646	0.298	0.086	9.726	0.133
	(0.610)	(0.613)	(0.512)	(0.550)	(0.538)	(0.642)	(0.547)	(0.520)
OH METZEN	0.453	0.034	0.112	0.644	0.297	0.087	9.722	0.133
	(0.595)	(0.691)	(0.685)	(0.572)	(0.593)	(0.795)	(0.552)	(0.520)
OK BOREN	0.388	0.035	0.164	0.584	0.137	0.044	9.435	0.194
	(0.732)	(0.694)	(0.879)	(0.666)	(0.712)	(0.558)	(0.653)	(0.550)
OK NICKLE	0.394	0.032	0.158	0.607	0.134	0.039	9.493	0.187
	(0.660)	(0.878)	(0.552)	(0.970)	(0.825)	(0.986)	(0.971)	(0.835)
OR HATFIE	0.413	0.004	0.124	0.731	0.159	0.095	9.656	0.188
	(0.549)	(0.582)	(0.550)	(0.628)	(0.601)	(0.626)	(0.518)	(0.640)
OR PACKWO	0.392	0.003	0.124	0.728	0.155	0.097	9.646	0.190
	(0.729)	(0.685)	(0.550)	(0.523)	(0.745)	(0.528)	(0.691)	(0.727)
PA SPECTE	0.391	0.023	0.130	0.636	0.286	0.079	9.664	0.145
	(0.614)	(0.525)	(0.502)	(0.624)	(0.514)	(0.684)	(0.530)	(0.580)

Table 4-3--Continued

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
PA HEINZ	0.391	0.021	0.130	0.636	0.285	0.080	9.666	0.145
	(0.614)	(0.602)	(0.502)	(0.624)	(0.530)	(0.545)	(0.517)	(0.580)
RI PELL	0.834	0.018	0.122	0.656	0.281	0.069	9.756	0.159
	(0.549)	(0.514)	(0.567)	(0.556)	(0.557)	(0.559)	(0.523)	(0.564)
RI CHAFEE	0.816	0.017	0.119	0.664	0.278	0.068	9.767	0.163
	(0.529)	(0.561)	(0.587)	(0.541)	(0.515)	(0.593)	(0.580)	(0.522)
SC THURMO	0.369	0.380	0.102	0.483	0.346	0.066	9.501	0.168
	(0.596)	(0.591)	(0.716)	(0.584)	(0.569)	(0.621)	(0.551)	(0.519)
SC HOLLIN	0.350	0.397	0.102	0.475	0.348	0.068	9.484	0.168
	(0.805)	(0.835)	(0.716)	(0.810)	(0.618)	(0.703)	(0.811)	(0.519)
SD PRESSL	0.151	0.001	0.155	0.622	0.054	0.041	9.327	0.194
	(0.885)	(0.640)	(0.902)	(0.708)	(0.711)	(0.878)	(0.775)	(0.867)
SD ABDNOR	0.165	0.001	0.153	0.625	0.053	0.041	9.337	0.194
	(0.791)	(0.640)	(0.821)	(0.593)	(0.768)	(0.878)	(0.612)	(0.867)
TN BAKER	0.293	0.071	0.125	0.465	0.318	0.085	9.427	0.167
	(0.513)	(0.701)	(0.535)	(0.570)	(0.607)	(0.526)	(0.537)	(0.560)
TN SASSER	0.278	0.075	0.127	0.461	0.318	0.084	9.426	0.170
	(0.720)	(0.562)	(0.799)	(0.608)	(0.607)	(0.698)	(0.515)	(0.721)
TX TOWER	0.412	0.058	0.149	0.530	0.109	0.036	9.525	0.168
	(0.976)	(0.997)	(0.690)	(0.895)	(0.999)	(0.979)	(0.816)	(0.551)
TX BENTSE	0.407	0.069	0.153	0.510	0.119	0.039	9.485	0.171
	(0.988)	(0.750)	(0.952)	(0.985)	(0.880)	(0.613)	(0.979)	(0.858)
UT GARN	0.348	0.002	0.096	0.770	0.109	0.055	9.642	0.232
	(0.674)	(0.602)	(0.703)	(0.627)	(0.599)	(0.522)	(0.719)	(0.530)
UT HATCH	0.321	0.002	0.097	0.769	0.107	0.055	9.633	0.233
	(0.809)	(0.602)	(0.759)	(0.592)	(0.532)	(0.522)	(0.798)	(0.557)
VA WARNER	0.416	0.198	0.120	0.522	0.231	0.056	9.626	0.197
	(0.530)	(0.625)	(0.727)	(0.503)	(0.538)	(0.588)	(0.584)	(0.654)

Table 4-3--Continued

ST NAME	URBAN	BLACK	OLD	EDU	MANF	UNE	LNINC	GOVEMP
VA TRIBLE	0.401	0.196	0.119	0.524	0.228	0.056	9.633	0.198
	(0.629)	(0.675)	(0.617)	(0.575)	(0.584)	(0.588)	(0.724)	(0.590)
VT LEAHY	0.227	0.002	0.118	0.686	0.227	0.071	9.559	0.146
	(0.534)	(0.734)	(0.573)	(0.563)	(0.573)	(0.502)	(0.590)	(0.576)
VT STAFFO	0.216	0.002	0.119	0.686	0.227	0.071	9.555	0.146
	(0.553)	(0.734)	(0.515)	(0.563)	(0.573)	(0.502)	(0.528)	(0.576)
WA GORTON	0.416	0.007	0.123	0.740	0.152	0.090	9.695	0.199
	(0.675)	(0.713)	(0.753)	(0.585)	(0.727)	(0.651)	(0.611)	(0.516)
WA EVANS	0.411	0.007	0.122	0.737	0.160	0.093	9.701	0.201
	(0.713)	(0.713)	(0.681)	(0.542)	(0.552)	(0.570)	(0.501)	(0.549)
WI KASTEN	0.351	0.005	0.141	0.656	0.241	0.078	9.630	0.139
	(0.526)	(0.674)	(0.551)	(0.628)	(0.697)	(0.674)	(0.636)	(0.839)
WI PROXMI	0.338	0.006	0.143	0.654	0.233	0.081	9.606	0.147
	(0.635)	(0.516)	(0.751)	(0.527)	(0.644)	(0.726)	(0.747)	(0.597)
WV RANDOL	0.206	0.020	0.127	0.517	0.175	0.095	9.496	0.188
	(0.624)	(0.556)	(0.544)	(0.670)	(0.567)	(0.650)	(0.601)	(0.500)
WV BYRD	0.209	0.019	0.127	0.518	0.177	0.095	9.497	0.188
	(0.585)	(0.655)	(0.544)	(0.636)	(0.506)	(0.650)	(0.585)	(0.500)
WY SIMPSO	0.445	0.002	0.099	0.760	0.051	0.039	9.790	0.182
	(0.763)	(0.749)	(0.793)	(0.610)	(0.607)	(0.544)	(0.808)	(0.506)
WY WALLOP	0.435	0.002	0.097	0.760	0.050	0.039	9.802	0.179
	(0.815)	(0.749)	(0.714)	(0.610)	(0.533)	(0.544)	(0.711)	(0.593)

Table 4-4
The Differences in Weighted Mean Characteristics
Between Two Incumbents

Z	URBAN	BLACK	OLD	EDU	MANF	UNE	INC	GOVEMP
0.5-0.6	26	26	23	25	27	20	19	29
0.6-0.7	8	8	13	14	10	14	18	10
0.7-0.8	5	5	4	2	7	5	2	3
0.8-0.9	4	3	3	0	1	4	2	5
0.9-1.0	4	5	4	6	2	4	6	0

Note: $Z = \frac{|\mu_A - \mu_B|}{\sigma/\sqrt{n}}$, where n is the number of counties.

Table 4-5
Incumbent's Share of Vote: Minimum Chi-Square Estimates

ST	YR	DEPVAR	INT	URB	BLACK	OLD	LNINC	EDU	UNE	MANF	GOVEMP
AL	80	REP	-0.689	-.410	-.222	3.795	-.102	2.830	-5.04	-1.02	-3.48
			(4.028)	(0.196)	(0.269)	(2.532)	(0.437)	(1.113)	(2.296)	(0.501)	(0.932)
			(0.865)	(0.040)	(0.413)	(0.139)	(0.816)	(0.014)	(0.032)	(0.047)	(0.000)
	84	DEM	-9.920	-.237	1.248	5.127	0.833	-.063	4.815	0.238	0.422
			(3.417)	(0.166)	(0.228)	(2.147)	(0.370)	(0.944)	(1.948)	(0.425)	(0.791)
			(0.005)	(0.159)	(0.000)	(0.020)	(0.028)	(0.947)	(0.016)	(0.578)	(0.596)
AZ	80	REP	3.989	-1.03	1.327	1.833	-.641	3.235	-11.4	-.552	-.170
			(16.19)	(0.465)	(4.356)	(4.754)	(1.684)	(1.228)	(4.089)	(2.043)	(2.731)
			(0.814)	(0.068)	(0.771)	(0.713)	(0.717)	(0.039)	(0.031)	(0.796)	(0.952)
	82	DEM	-32.483	-.760	-4.37	7.736	3.281	-1.17	-10.4	-.712	5.179
			(21.76)	(0.625)	(5.854)	(6.388)	(2.262)	(1.650)	(5.494)	(2.746)	(3.670)
			(0.186)	(0.269)	(0.483)	(0.271)	(0.197)	(0.504)	(0.106)	(0.804)	(0.208)
AR	78	DEM	2.694	-.198	0.010	1.919	-.383	-.860	1.578	0.095	-.184
			(3.756)	(0.211)	(0.264)	(1.361)	(0.417)	(0.868)	(1.684)	(0.587)	(1.322)
			(0.476)	(0.351)	(0.971)	(0.163)	(0.362)	(0.325)	(0.352)	(0.872)	(0.890)
	80	REP	12.592	-.091	-1.65	-.913	-1.68	4.164	2.791	1.087	-3.18
			(4.063)	(0.228)	(0.286)	(1.472)	(0.451)	(0.939)	(1.821)	(0.635)	(1.430)
			(0.003)	(0.692)	(0.000)	(0.537)	(0.000)	(0.000)	(0.130)	(0.092)	(0.029)
CA	80	DEM	-6.439	0.076	0.176	3.906	0.376	1.359	0.687	0.392	1.381
			(2.848)	(0.127)	(0.805)	(0.988)	(0.300)	(0.382)	(1.041)	(0.559)	(0.595)
			(0.028)	(0.552)	(0.828)	(0.000)	(0.216)	(0.001)	(0.512)	(0.487)	(0.024)
	82	REP	-4.922	-.296	-4.49	3.095	0.315	0.898	-.483	0.092	1.367
			(2.873)	(0.128)	(0.812)	(0.997)	(0.303)	(0.386)	(1.050)	(0.564)	(0.600)
			(0.093)	(0.025)	(0.000)	(0.003)	(0.303)	(0.024)	(0.647)	(0.870)	(0.027)
CO	78	REP	4.358	-.720	-1.39	3.285	-.641	1.415	-5.63	1.769	-.281
			(3.344)	(0.163)	(2.635)	(1.659)	(0.345)	(0.726)	(2.044)	(0.980)	(0.844)
			(0.198)	(0.000)	(0.600)	(0.053)	(0.068)	(0.056)	(0.008)	(0.077)	(0.740)
	80	DEM	5.982	-.200	1.269	-2.03	-.773	0.926	0.351	0.746	0.276
			(3.046)	(0.148)	(2.400)	(1.511)	(0.314)	(0.661)	(1.862)	(0.893)	(0.769)
			(0.055)	(0.182)	(0.599)	(0.185)	(0.017)	(0.167)	(0.851)	(0.407)	(0.721)
FL	80	REP	-7.177	0.070	-.722	2.509	0.537	0.808	1.813	-.344	-.068
			(2.761)	(0.136)	(0.293)	(0.567)	(0.297)	(0.526)	(2.142)	(0.497)	(0.519)
			(0.012)	(0.606)	(0.017)	(0.000)	(0.076)	(0.130)	(0.401)	(0.492)	(0.896)
GA	78	DEM	-14.030	-.139	0.678	10.1	1.190	-.168	-3.38	-.606	0.543
			(2.298)	(0.127)	(0.188)	(1.648)	(0.240)	(0.601)	(1.664)	(0.424)	(0.652)
			(0.000)	(0.278)	(0.000)	(0.000)	(0.000)	(0.780)	(0.044)	(0.155)	(0.406)
	80	REP	-13.424	-.124	-.747	8.478	1.120	1.701	-2.58	-.410	-.428
			(2.270)	(0.126)	(0.186)	(1.628)	(0.237)	(0.594)	(1.643)	(0.419)	(0.644)
			(0.000)	(0.324)	(0.000)	(0.000)	(0.000)	(0.005)	(0.119)	(0.329)	(0.507)
ID	78	REP	-0.050	-.621	-32.6	0.268	-.190	1.639	-4.11	1.493	2.514
			(5.121)	(0.284)	(11.51)	(2.592)	(0.544)	(1.040)	(1.181)	(1.394)	(0.979)
			(0.992)	(0.035)	(0.008)	(0.918)	(0.728)	(0.124)	(0.001)	(0.292)	(0.015)
	80	REP	-0.158	-.632	-20.2	2.456	-.189	1.893	-2.79	1.652	0.620
			(6.601)	(0.366)	(14.84)	(3.341)	(0.701)	(1.340)	(1.523)	(1.797)	(1.262)
			(0.981)	(0.093)	(0.181)	(0.467)	(0.789)	(0.167)	(0.076)	(0.364)	(0.626)
IL	78	REP	-5.371	-.630	0.330	2.308	0.395	0.673	0.373	-.663	-.536
			(2.711)	(0.110)	(0.413)	(1.500)	(0.261)	(0.570)	(1.155)	(0.467)	(0.667)
			(0.050)	(0.000)	(0.426)	(0.127)	(0.133)	(0.241)	(0.748)	(0.158)	(0.424)
	80	DEM	0.139	0.019	0.479	1.188	-.083	-.292	2.015	-.957	-1.21
			(2.254)	(0.091)	(0.343)	(1.247)	(0.217)	(0.474)	(0.960)	(0.388)	(0.555)
			(0.951)	(0.837)	(0.166)	(0.343)	(0.702)	(0.540)	(0.039)	(0.015)	(0.032)

Note: Standard Deviations are in the parentheses below estimates, and probabilities rejecting null hypotheses are in the parentheses below the standard deviations.

Table 4-5--Continued

ST	YR	DEPVAR	INT	URB	BLACK	OLD	LNINC	EDU	UNE	MANF	GOVEMP
IA	80	REP	-6.651	-.373	-.980	2.540	0.441	1.854	1.328	0.485	0.384
			(3.008)	(0.117)	(0.664)	(1.457)	(0.302)	(0.488)	(1.089)	(0.391)	(0.753)
			(0.030)	(0.002)	(0.144)	(0.085)	(0.149)	(0.000)	(0.226)	(0.217)	(0.611)
	82	REP	-6.597	-.325	-1.37	4.584	0.424	1.259	0.079	0.787	0.626
			(3.054)	(0.119)	(0.674)	(1.479)	(0.307)	(0.496)	(1.106)	(0.397)	(0.764)
			(0.034)	(0.008)	(0.045)	(0.003)	(0.171)	(0.013)	(0.943)	(0.050)	(0.415)
IA	78	REP	-0.461	-.202	-1.25	1.285	-.060	-.013	-.799	-.466	-1.61
			(2.417)	(0.098)	(2.173)	(1.098)	(0.246)	(0.488)	(1.253)	(0.346)	(0.483)
			(0.849)	(0.043)	(0.568)	(0.245)	(0.809)	(0.978)	(0.525)	(0.181)	(0.001)
	80	REP	-2.910	-.288	-1.45	1.197	0.316	-.497	-2.12	-.758	-1.66
			(2.861)	(0.116)	(2.572)	(1.300)	(0.291)	(0.577)	(1.483)	(0.410)	(0.572)
			(0.312)	(0.015)	(0.574)	(0.360)	(0.281)	(0.392)	(0.157)	(0.067)	(0.005)
KS	78	REP	-2.305	0.003	-1.48	3.244	0.086	0.443	-9.38	-.516	0.232
			(1.909)	(0.076)	(0.655)	(0.587)	(0.200)	(0.464)	(1.579)	(0.324)	(0.465)
			(0.230)	(0.969)	(0.026)	(0.000)	(0.669)	(0.341)	(0.000)	(0.115)	(0.619)
	80	REP	-0.908	-.150	-1.91	1.569	0.046	0.478	-6.84	-1.14	-.451
			(2.032)	(0.081)	(0.697)	(0.625)	(0.213)	(0.494)	(1.681)	(0.345)	(0.495)
			(0.656)	(0.068)	(0.007)	(0.014)	(0.829)	(0.336)	(0.000)	(0.001)	(0.365)
KY	78	DEM	-10.685	-.161	0.771	3.417	0.937	-1.47	-2.93	0.143	1.903
			(3.572)	(0.201)	(1.000)	(1.509)	(0.392)	(0.903)	(1.444)	(0.510)	(0.889)
			(0.003)	(0.426)	(0.442)	(0.025)	(0.019)	(0.106)	(0.045)	(0.780)	(0.035)
	80	DEM	-16.185	-.306	0.612	6.631	1.509	-.488	1.614	0.027	2.138
			(2.714)	(0.153)	(0.760)	(1.146)	(0.298)	(0.686)	(1.097)	(0.388)	(0.676)
			(0.000)	(0.048)	(0.422)	(0.000)	(0.000)	(0.478)	(0.144)	(0.944)	(0.002)
LA	80	DEM	-4.005	-.350	0.417	1.887	0.245	-1.5	5.202	1.458	0.804
			(6.429)	(0.370)	(0.588)	(3.803)	(0.644)	(1.178)	(4.724)	(1.482)	(1.563)
			(0.536)	(0.348)	(0.482)	(0.622)	(0.705)	(0.208)	(0.276)	(0.329)	(0.609)
	84	DEM	-8.310	-.181	0.634	2.426	0.790	-2.45	11.05	0.676	0.196
			(8.177)	(0.470)	(0.748)	(4.838)	(0.819)	(1.499)	(6.009)	(1.885)	(1.989)
			(0.314)	(0.701)	(0.400)	(0.618)	(0.339)	(0.109)	(0.071)	(0.721)	(0.922)
ME	78	REP	8.719	-.352	-22.9	0.610	-1.05	1.796	-5.32	-1.01	-.847
			(10.72)	(0.414)	(14.49)	(2.879)	(1.235)	(1.541)	(3.236)	(0.884)	(1.876)
			(0.443)	(0.423)	(0.157)	(0.838)	(0.423)	(0.282)	(0.144)	(0.290)	(0.665)
	82	DEM	-15.889	-.751	-28.3	-3.46	2.093	-3.38	-2.2	-2.41	-4.34
			(9.087)	(0.351)	(12.28)	(2.440)	(1.046)	(1.306)	(2.742)	(0.749)	(1.590)
			(0.124)	(0.070)	(0.055)	(0.199)	(0.086)	(0.036)	(0.448)	(0.015)	(0.029)
MD	80	REP	-7.041	0.217	-.458	3.540	0.531	1.604	3.296	-1.31	-2.5
			(8.478)	(0.324)	(0.746)	(4.252)	(0.845)	(2.270)	(5.627)	(2.281)	(2.362)
			(0.419)	(0.513)	(0.549)	(0.418)	(0.539)	(0.491)	(0.567)	(0.575)	(0.306)
	82	DEM	-14.706	-.005	0.456	4.804	1.158	1.780	10.14	-.094	-1.37
			(6.213)	(0.237)	(0.547)	(3.116)	(0.619)	(1.664)	(4.124)	(1.672)	(1.731)
			(0.032)	(0.982)	(0.417)	(0.144)	(0.081)	(0.302)	(0.027)	(0.956)	(0.442)
MA	78	DEM	5.661	0.965	-3.25	-.972	-.967	2.481	5.557	1.149	-1.33
			(13.63)	(0.563)	(3.445)	(3.140)	(1.385)	(1.255)	(3.642)	(1.483)	(2.259)
			(0.695)	(0.147)	(0.389)	(0.769)	(0.516)	(0.105)	(0.188)	(0.473)	(0.582)
	82	DEM	33.395	1.043	-9.83	-7	-3.3	1.159	-6.32	-3.62	-7.93
			(11.61)	(0.480)	(2.936)	(2.675)	(1.181)	(1.069)	(3.103)	(1.263)	(1.925)
			(0.035)	(0.082)	(0.020)	(0.047)	(0.038)	(0.328)	(0.097)	(0.035)	(0.009)
MI	78	DEM	-6.284	0.300	-.410	5.750	0.444	0.029	2.496	-1.22	-.358
			(2.722)	(0.130)	(0.541)	(1.270)	(0.276)	(0.707)	(1.119)	(0.551)	(0.551)
			(0.024)	(0.024)	(0.451)	(0.000)	(0.112)	(0.968)	(0.029)	(0.030)	(0.518)
	82	DEM	-9.486	0.096	0.416	5.497	0.791	-.250	3.100	-.600	-.139
			(2.470)	(0.118)	(0.491)	(1.152)	(0.251)	(0.641)	(1.015)	(0.500)	(0.500)
			(0.000)	(0.419)	(0.400)	(0.000)	(0.002)	(0.698)	(0.003)	(0.235)	(0.781)

Table 4-5--Continued

ST	YR	DEPVAR	INT	URB	BLACK	OLD	LNINC	EDU	UNE	MANF	GOVEMP
MN	82	REP	13.204	-.455	-.740	-2.35	-1.49	1.946	-4.5	1.412	-1.69
			(2.991)	(0.132)	(4.930)	(1.212)	(0.325)	(0.719)	(0.760)	(0.444)	(0.817)
			(0.000)	(0.001)	(0.881)	(0.056)	(0.000)	(0.008)	(0.000)	(0.002)	(0.042)
	84	REP	14.110	-.489	-2.53	-3.66	-1.53	2.156	-4.31	1.275	-1.78
			(3.206)	(0.141)	(5.285)	(1.299)	(0.348)	(0.770)	(0.815)	(0.476)	(0.876)
			(0.000)	(0.001)	(0.633)	(0.006)	(0.000)	(0.006)	(0.000)	(0.009)	(0.046)
MS	78	REP	-5.041	-.323	0.471	10.23	0.054	3.736	-.984	-.380	-1.41
			(4.220)	(0.198)	(0.312)	(2.567)	(0.450)	(0.984)	(2.042)	(0.585)	(0.993)
			(0.236)	(0.106)	(0.136)	(0.000)	(0.906)	(0.000)	(0.631)	(0.518)	(0.161)
	82	DEM	-2.435	-.756	0.631	5.380	-.033	1.377	3.068	0.518	0.066
			(3.030)	(0.142)	(0.224)	(1.843)	(0.323)	(0.706)	(1.466)	(0.420)	(0.713)
			(0.424)	(0.000)	(0.006)	(0.005)	(0.919)	(0.055)	(0.040)	(0.221)	(0.926)
MO	80	DEM	-5.635	-.310	1.162	2.083	0.556	-.649	-3.14	-.682	-.340
			(2.199)	(0.143)	(0.734)	(1.179)	(0.224)	(0.558)	(1.614)	(0.591)	(0.696)
			(0.012)	(0.033)	(0.116)	(0.080)	(0.015)	(0.247)	(0.054)	(0.251)	(0.626)
	82	REP	-6.798	-.229	0.475	4.928	0.476	0.188	-1.56	1.111	1.027
			(2.677)	(0.175)	(0.678)	(1.401)	(0.274)	(0.674)	(1.950)	(0.714)	(0.850)
			(0.013)	(0.193)	(0.485)	(0.001)	(0.085)	(0.781)	(0.425)	(0.122)	(0.229)
MT	78	DEM	-3.478	-.218	7.669	2.688	0.264	-.346	-1.29	0.719	0.890
			(4.065)	(0.156)	(14.66)	(1.843)	(0.410)	(0.946)	(1.227)	(1.633)	(0.706)
			(0.397)	(0.169)	(0.603)	(0.151)	(0.523)	(0.716)	(0.298)	(0.662)	(0.213)
	82	DEM	-0.866	-.320	16.5	0.504	0.160	-1.62	-.903	-2.44	0.431
			(4.101)	(0.157)	(14.79)	(1.859)	(0.414)	(0.954)	(1.238)	(1.648)	(0.712)
			(0.834)	(0.047)	(0.270)	(0.787)	(0.700)	(0.095)	(0.469)	(0.146)	(0.548)
NE	78	DEM	2.745	-.392	1.329	1.931	-.468	1.564	-4.32	0.755	-1.5
			(2.801)	(0.152)	(2.582)	(1.090)	(0.292)	(0.752)	(2.481)	(0.652)	(0.740)
			(0.330)	(0.012)	(0.608)	(0.080)	(0.113)	(0.041)	(0.085)	(0.250)	(0.046)
	82	DEM	1.953	-.594	5.083	2.047	-.407	1.656	-2.46	1.433	-.944
			(3.473)	(0.189)	(3.202)	(1.351)	(0.362)	(0.932)	(3.077)	(0.809)	(0.918)
			(0.575)	(0.002)	(0.116)	(0.134)	(0.265)	(0.079)	(0.427)	(0.080)	(0.307)
NV	80	REP	2.562	-.161	-6.36	1.096	-.401	1.246	-7.2	-1.7	1.689
			(8.270)	(0.249)	(2.844)	(4.085)	(0.926)	(1.833)	(5.597)	(3.005)	(0.989)
			(0.765)	(0.535)	(0.056)	(0.795)	(0.677)	(0.516)	(0.234)	(0.587)	(0.126)
	82	REP	-15.035	-.678	-6.72	-1.81	1.605	-1.09	-6.93	-.402	1.894
			(9.375)	(0.282)	(3.224)	(4.631)	(1.049)	(2.078)	(6.345)	(3.406)	(1.121)
			(0.147)	(0.043)	(0.070)	(0.706)	(0.165)	(0.614)	(0.306)	(0.909)	(0.130)
NH	78	REP	-21.117	-.235	.	14.91	2.095	-1.96	-1.36	-2.51	.
			(8.460)	(0.422)	.	(5.372)	(0.791)	(1.711)	(3.440)	(0.977)	.
			(0.088)	(0.616)	.	(0.069)	(0.077)	(0.335)	(0.719)	(0.082)	.
	80	REP	-25.484	0.036	.	16.17	2.213	2.035	3.803	-1.55	.
			(17.26)	(0.861)	.	(10.96)	(1.615)	(3.492)	(7.018)	(1.994)	.
			(0.236)	(0.969)	.	(0.237)	(0.264)	(0.601)	(0.626)	(0.495)	.
NJ	78	DEM	-4.548	0.451	-.248	0.639	0.376	-1.55	-.633	-.522	1.243
			(9.336)	(0.221)	(0.623)	(1.817)	(1.048)	(2.029)	(3.905)	(1.148)	(1.581)
			(0.635)	(0.064)	(0.698)	(0.731)	(0.726)	(0.461)	(0.874)	(0.657)	(0.447)
	82	DEM	-7.453	0.510	-.027	0.791	0.670	-2.02	2.124	-.379	1.497
			(9.754)	(0.231)	(0.651)	(1.898)	(1.095)	(2.120)	(4.080)	(1.199)	(1.652)
			(0.460)	(0.048)	(0.968)	(0.684)	(0.552)	(0.360)	(0.612)	(0.758)	(0.383)
NM	78	REP	-2.619	-.651	0.107	4.807	0.022	1.454	-3.27	0.546	1.258
			(4.919)	(0.273)	(4.538)	(2.005)	(0.513)	(1.123)	(2.440)	(1.448)	(0.713)
			(0.599)	(0.025)	(0.981)	(0.025)	(0.966)	(0.208)	(0.192)	(0.709)	(0.091)
	82	DEM	1.545	-.478	-18.5	25.38	-.708	3.703	-8.51	-4.95	0.143
			(22.83)	(1.579)	(18.79)	(12.18)	(2.342)	(4.904)	(13.1)	(6.158)	(3.504)
			(0.947)	(0.766)	(0.341)	(0.055)	(0.767)	(0.462)	(0.526)	(0.434)	(0.968)

Table 4-5--Continued

ST	YR	DEPVAR	INT	URB	BLACK	OLD	LNINC	EDU	UNE	MANF	GOVEMP
NY	80	REP	-12.720	-.337	-3.25	4.509	1.023	0.389	5.293	1.377	2.168
			(2.096)	(0.136)	(0.649)	(1.315)	(0.221)	(0.793)	(1.274)	(0.489)	(0.856)
			(0.000)	(0.016)	(0.000)	(0.001)	(0.000)	(0.626)	(0.000)	(0.007)	(0.014)
	82	DEM	-5.806	0.385	-.731	6.824	0.197	1.443	0.259	0.887	3.028
			(1.908)	(0.124)	(0.591)	(1.197)	(0.201)	(0.722)	(1.159)	(0.445)	(0.780)
			(0.004)	(0.003)	(0.222)	(0.000)	(0.332)	(0.051)	(0.824)	(0.051)	(0.000)
NC	78	REP	-1.887	-.462	-1.68	2.550	0.112	-.294	-1.08	-.637	-1.64
			(3.684)	(0.221)	(0.250)	(1.692)	(0.388)	(0.920)	(2.019)	(0.601)	(1.012)
			(0.610)	(0.040)	(0.000)	(0.135)	(0.774)	(0.750)	(0.594)	(0.292)	(0.109)
	80	REP	-1.796	-.056	-2.07	1.344	0.154	-.114	-1.63	-.435	-2.49
			(3.201)	(0.192)	(0.217)	(1.470)	(0.338)	(0.800)	(1.755)	(0.522)	(0.879)
			(0.576)	(0.771)	(0.000)	(0.363)	(0.650)	(0.886)	(0.355)	(0.407)	(0.006)
ND	80	REP	-1.048	-.198	-7.69	0.689	0.240	-1.27	-4.04	-1.19	-1.66
			(2.490)	(0.119)	(9.791)	(0.863)	(0.273)	(0.541)	(1.593)	(0.686)	(0.760)
			(0.676)	(0.103)	(0.436)	(0.429)	(0.384)	(0.023)	(0.015)	(0.089)	(0.034)
	82	DEM	-4.579	-.412	-18.6	1.755	0.366	0.809	1.114	-.598	-.217
			(2.677)	(0.128)	(10.53)	(0.928)	(0.293)	(0.582)	(1.713)	(0.738)	(0.818)
			(0.094)	(0.002)	(0.084)	(0.065)	(0.219)	(0.171)	(0.519)	(0.422)	(0.792)
OH	80	DEM	-9.249	0.021	0.627	2.802	0.828	-.398	2.752	0.043	1.517
			(4.163)	(0.160)	(0.816)	(2.149)	(0.421)	(0.630)	(1.275)	(0.507)	(1.143)
			(0.029)	(0.897)	(0.444)	(0.196)	(0.053)	(0.529)	(0.034)	(0.933)	(0.188)
	82	DEM	-13.577	-.060	1.262	6.417	1.122	-.408	5.751	0.555	2.497
			(4.302)	(0.166)	(0.843)	(2.220)	(0.435)	(0.651)	(1.318)	(0.524)	(1.181)
			(0.002)	(0.717)	(0.139)	(0.005)	(0.012)	(0.532)	(0.000)	(0.292)	(0.038)
OK	78	DEM	-5.681	-.096	-.401	5.035	0.419	-.194	1.795	-.513	0.196
			(2.283)	(0.091)	(0.526)	(0.868)	(0.234)	(0.460)	(1.679)	(0.376)	(0.496)
			(0.015)	(0.294)	(0.448)	(0.000)	(0.077)	(0.674)	(0.289)	(0.176)	(0.693)
	80	REP	-8.930	-.466	-1.47	3.002	0.674	2.624	-3.25	-.141	-.428
			(3.106)	(0.124)	(0.715)	(1.182)	(0.318)	(0.625)	(2.284)	(0.511)	(0.675)
			(0.005)	(0.000)	(0.044)	(0.013)	(0.038)	(0.000)	(0.159)	(0.783)	(0.528)
OR	78	REP	-4.568	-.178	1.137	3.470	0.166	2.031	-2.2	0.542	1.731
			(4.486)	(0.158)	(4.121)	(1.763)	(0.471)	(0.992)	(1.223)	(0.861)	(0.818)
			(0.318)	(0.270)	(0.785)	(0.059)	(0.727)	(0.050)	(0.083)	(0.534)	(0.044)
	80	REP	-1.270	-.417	-3.14	0.088	0.044	0.730	0.623	-2.08	0.853
			(4.174)	(0.147)	(3.834)	(2.879)	(0.537)	(1.277)	(2.787)	(0.681)	(1.040)
			(0.294)	(0.243)	(0.005)	(0.815)	(0.335)	(0.143)	(0.521)	(0.727)	(0.528)
SD	78	REP	-1.243	-.580	-14.7	1.225	0.128	0.705	-3.93	-3.16	-2.17
			(2.494)	(0.140)	(8.990)	(1.224)	(0.274)	(0.578)	(1.135)	(0.800)	(0.471)
			(0.620)	(0.000)	(0.108)	(0.321)	(0.644)	(0.227)	(0.001)	(0.000)	(0.000)
	80	REP	-5.247	-.596	7.078	0.128	0.641	0.471	-3.84	-7.03	-3.24
			(5.323)	(0.296)	(19.14)	(2.601)	(0.585)	(1.230)	(2.412)	(1.694)	(1.005)
			(0.328)	(0.049)	(0.713)	(0.961)	(0.277)	(0.703)	(0.117)	(0.000)	(0.002)
TN	78	REP	-0.929	0.029	-.786	0.189	-.140	1.131	1.354	0.534	0.069
			(2.645)	(0.187)	(0.286)	(1.510)	(0.292)	(0.792)	(1.676)	(0.499)	(0.749)
			(0.726)	(0.877)	(0.007)	(0.901)	(0.632)	(0.157)	(0.421)	(0.288)	(0.927)
	82	DEM	-7.491	-.362	-.130	6.366	0.623	-.545	-3.35	-.052	2.253
			(2.704)	(0.191)	(0.292)	(1.544)	(0.299)	(0.810)	(1.713)	(0.510)	(0.766)
			(0.007)	(0.061)	(0.657)	(0.000)	(0.040)	(0.503)	(0.054)	(0.920)	(0.004)
TX	78	REP	-5.042	-.282	-1.09	1.441	0.319	1.144	-3.02	-2.39	-.443
			(1.677)	(0.070)	(0.258)	(0.536)	(0.175)	(0.298)	(1.196)	(0.326)	(0.478)
			(0.003)	(0.000)	(0.000)	(0.008)	(0.069)	(0.000)	(0.012)	(0.000)	(0.355)
	82	DEM	-3.407	-.455	-.595	1.649	0.278	-1.42	1.819	-.030	1.440
			(1.687)	(0.071)	(0.260)	(0.539)	(0.176)	(0.299)	(1.204)	(0.328)	(0.481)
			(0.045)	(0.000)	(0.023)	(0.002)	(0.115)	(0.000)	(0.132)	(0.926)	(0.003)

Table 4-5--Continued

ST	YR	DEPVAR	INT	URB	BLACK	OLD	LNINC	EDU	UNE	MANF	GOVEMP
UT	80	REP	5.567	-.367	-12.6	2.014	-.845	3.279	-2.41	1.245	1.045
			(4.176)	(0.193)	(14.42)	(2.260)	(0.403)	(0.827)	(2.894)	(0.794)	(0.682)
			(0.197)	(0.072)	(0.391)	(0.383)	(0.049)	(0.001)	(0.416)	(0.132)	(0.141)
	82	REP	11.499	-.694	-8.97	-1.61	-1.43	3.223	-4.48	0.761	0.771
			(5.382)	(0.249)	(18.58)	(2.912)	(0.520)	(1.066)	(3.729)	(1.023)	(0.879)
			(0.045)	(0.011)	(0.635)	(0.585)	(0.012)	(0.007)	(0.243)	(0.466)	(0.391)
VA	78	REP	-7.482	0.049	-.237	3.836	0.620	-.727	-2.44	-.041	-.249
			(2.479)	(0.080)	(0.170)	(0.958)	(0.254)	(0.481)	(1.839)	(0.306)	(0.570)
			(0.003)	(0.543)	(0.165)	(0.000)	(0.016)	(0.133)	(0.188)	(0.894)	(0.662)
	82	REP	-10.08	-.161	-.260	4.073	0.884	-.389	-.592	-.002	0.000
			(2.923)	(0.095)	(0.200)	(1.130)	(0.300)	(0.567)	(2.168)	(0.361)	(0.672)
			(0.001)	(0.091)	(0.196)	(0.000)	(0.004)	(0.494)	(0.785)	(0.996)	(1.000)
WA	80	REP	2.466	-.458	-2.99	1.413	-.322	1.146	-3.13	-1.72	-1.37
			(3.301)	(0.148)	(2.623)	(1.435)	(0.337)	(0.619)	(1.164)	(0.543)	(0.489)
			(0.461)	(0.004)	(0.263)	(0.333)	(0.347)	(0.074)	(0.012)	(0.003)	(0.009)
	82	DEM	-11.45	-.229	-1.28	5.465	1.074	-.657	1.127	-.105	1.148
			(3.280)	(0.147)	(2.606)	(1.426)	(0.335)	(0.615)	(1.157)	(0.539)	(0.486)
			(0.001)	(0.130)	(0.627)	(0.001)	(0.003)	(0.294)	(0.338)	(0.847)	(0.025)
WV	78	DEM	-7.913	0.071	-1.88	3.484	0.710	-1.73	1.136	-.290	0.507
			(4.173)	(0.247)	(1.202)	(2.286)	(0.429)	(0.844)	(1.574)	(0.446)	(0.846)
			(0.064)	(0.773)	(0.125)	(0.134)	(0.105)	(0.046)	(0.474)	(0.518)	(0.552)
	82	DEM	-7.583	0.116	-1.93	4.178	0.709	-1.68	1.776	-.011	0.719
			(3.932)	(0.232)	(1.132)	(2.154)	(0.404)	(0.795)	(1.483)	(0.420)	(0.797)
			(0.060)	(0.618)	(0.095)	(0.059)	(0.086)	(0.039)	(0.237)	(0.980)	(0.372)
WI	80	REP	-3.630	-.205	-2.34	3.118	0.199	1.447	0.444	0.688	-3.1
			(5.216)	(0.206)	(1.658)	(2.612)	(0.534)	(0.789)	(1.628)	(0.625)	(0.877)
			(0.489)	(0.323)	(0.164)	(0.237)	(0.711)	(0.071)	(0.786)	(0.275)	(0.001)
	82	DEM	13.967	-.203	2.564	-3.45	-1.75	3.392	2.169	1.258	-.932
			(6.084)	(0.242)	(1.942)	(2.992)	(0.623)	(0.925)	(1.896)	(0.732)	(1.026)
			(0.025)	(0.405)	(0.191)	(0.253)	(0.007)	(0.000)	(0.257)	(0.091)	(0.367)
WY	78	REP	0.140	-.532	-11.2	7.070	-.487	4.611	-2.77	2.420	-.748
			(11.55)	(0.346)	(10.39)	(4.421)	(1.036)	(1.821)	(5.318)	(2.044)	(1.649)
			(0.990)	(0.146)	(0.300)	(0.132)	(0.646)	(0.024)	(0.611)	(0.256)	(0.657)
	82	REP	-8.102	-1.03	-14.9	7.417	0.414	4.371	-2.32	1.972	-.610
			(14.47)	(0.433)	(13.01)	(5.538)	(1.298)	(2.281)	(6.662)	(2.561)	(2.066)
			(0.584)	(0.033)	(0.271)	(0.202)	(0.754)	(0.076)	(0.733)	(0.454)	(0.772)

Table 4-6
PACs' Contributions in Thousand of Dollars

PACs	77-78	79-80	81-82	83-84
Corporate	9,800 (785)	19,182 (1,206)	27,528 (1,469)	39,008 (4,009)
Labor	10,300 (217)	13,211 (297)	20,288 (380)	26,164 (394)
Trade/ Health	11,500 (453)	15,878 (576)	21,872 (651)	28,346 (698)
Non-Connected	2,600 (162)	4,944 (376)	10,746 (723)	15,322 (1,053)
Cooperative	900 (12)	1,372 (42)	2,116 (47)	2,621 (52)
Corporation w/o stock	130 (24)	632 (56)	1,067 (103)	1,506 (130)
Total	35,100 (1,653)	55,217 (2,551)	83,620 (3,371)	106,826 (4,009)

Note: The number of organizations in parenthesis.
Source: Zuckerman, E. Almanac of Federal PACs (1986), pp. 372-373.

Table 4-7
Senators' ADA Ranking Estimated by
Constituents' Characteristics

variable	TEST 1 estimate	TEST 2 estimate	TEST 3 estimate
INTERCEP	-173.148	43.278	140.465
URBAN	60.559[a]	64.509[a]	51.513[a]
BLACK	-2.476	-8.353	-1.850
OLD	420.064[b]	404.87[b]	124.958[a]
INC	15.986	-8.269	-10.794
EDU	-60.007	-59.531	-66.513[a]
UNE	568.959[a]	417.09[a]	142.646
MANF	-76.383	-53.086	-45.887[c]
UNION	63.353	99.177[a]	121.841[a]
GOVEMP	-90.126	-7.445	-41.078
F	3.560	4.516	5.786
R^2	0.28	0.33	0.40

Note: 1) a, b and c are significant at 1%, 5% and 10% level, respectively
2) TEST 1 used the state average characteristics.
3) TEST 2 used the weighted mean characteristics.
4) TEST 3 used the derived characteristics from the minimu chi-square regression.

Table 4-8
Senators' ADA Rankings Estimated by the Characteristics, PACs' Contributions and Party Affiliation

variable	TEST 4 estimate	TEST 5 estimate	TEST 6 estimate
INTERCEP	76.447	85.801	193.507
URBAN	37.750[b]	30.476	17.820[c]
BLACK	74.033	90.768	140.351[c]
OLD	159.159	200.587	93.488[c]
INC	-5.220	-7.302	-17.751
EDU	-40.453	-36.841	-10.073
UNE	351.511[a]	337.252[a]	10.124
MANF	-9.723	-8.567	6.311
UNION	-34.577	-27.417	38.541
GOVEMP	-84.724	-59.008	-69.134
COPR	-3.935	-3.551	-4.563
LABOR	9.168[a]	8.667[a]	8.652[a]
NONCON	-0.367	-0.507	0.118
TMH	-0.810	-0.735	1.396
COOP	2.587	1.976	3.058
NOSTK	-2.277	-2.031	-2.386
PARTY	24.897[b]	25.466[a]	25.194[a]
SOUTH	-7.928	-8.869	-5.816
SOUBLA	-123.762	-134.343	-156.580[a]

Table 4-9
PACs' Campaign Contributions to Senators (1978-1982)

	1978		1980		1982	
PACs	mean	total	mean	total	mean	total
CORP	$72,137	$2,380,553	$139,770	$4,752,171	$188,769	$6,040,601
LABOR	27,226	898,476	41,161	1,399,501	94,627	3,028,063
NONCON	10,459	345,163	33,215	1,129,337	56,831	1,818,595
TMH	55,055	1,816,839	76,736	2,609,011	121,039	3,873,253
COOP	3,780	124,750	5,136	174,650	11,561	369,976
NOSTK	485	16,025	4,688	159,425	7,152	228,875

Source: Federal Election Commission, Campaign Expenditures in the United State (1977-1978, 1979-1980 and 1981-1982).

Table 4-10
ADA Ranking Differences Between Two Senators

variable	OLS estimates	LOGIT estimates
INTERCEP	1.040 (0.326)	-2.130 (-11.47)
URBAN	28.370 (2.712)	-0.461 (-0.648)
BLACK	-15.313 (-0.701)	-1.773 (-1.178)
OLD	90.311 (1.448)	11.533 (1.823)
INC	6.264 (0.410)	-0.988 (-0.823)
EDU	4.468 (0.139)	0.468 (0.213)
UNE	-20.496 (-0.209)	-4.358 (-0.696)
MANF	28.429 (1.234)	1.922 (1.136)
GOVEMP	-35.975 (-0.733)	-2.460 (-0.544)
CORP	-3.753 (-0.841)	-1.136 (-2.689)
LABOR	8.094 (2.655)	-0.110 (-0.505)
NONCON	0.929 (0.384)	0.377 (2.154)
TMH	-0.637 (-0.132)	0.362 (0.962)
COOP	3.305 (1.150)	0.242 (1.190)
NOSTK	-2.752 (-1.124)	-0.013 (-0.072)
DP*CORP	3.680 (0.534)	1.582 (2.481)
DP*LABOR	-1.683 (-0.459)	0.534 (1.759)
DP*COOP	-2.033 (-0.464)	-0.863 (-2.059)
DP*NONCON	2.884 (0.833)	-0.678 (-2.483)
DP*NOSTK	3.786 (1.040)	0.144 (0.560)
DP*TMH	-12.193 (-1.792)	-0.614 (-1.237)
DP	31.212 (5.142)	1.711 (3.975)
F	4.196	10.478
adj-R^2	0.545	0.700

Note: t-statistics in parentheses

CHAPTER 5
SUMMARY AND CONCLUSIONS

Politicians' personal ideology was found to be an important factor in congressional decision making. Scholars regard ideological voting as political shirking because ideology is consumed more in votes on general issues, less on economic issues, and more by powerful politicians. The conclusion would be more convincing if one could find evidence that politicians cannot make political investments on social issues and that powerful politicians need no political investments.

In this dissertation, politicians' ideological voting behavior was revisited by using two different litmus tests. The principal-agent theory makes two predictions on agency costs. One is that the principal punishes the shirker by not renewing a contract, and the other is that the agent shirks in the final period of a contract. If the ideological voting is political shirking, then one would observe that incumbent losers in an election must have consumed more ideological voting in his office, and that retiring politicians would consume more ideological voting in the final period.

I found that retiring senators consumed more ideological voting and the incumbent winners and losers in re-election showed no difference in consuming ideological voting. These findings are partially sufficient to conclude that ideological voting is political shirking because the retiring senators have no incentive to make a political investment: as long as an incumbent wants to run for re-election he would not behave to damage himself, but he does shirk when he decides to retire.

A strong interpretation of the empirical tests would be justified only if the research methodology is convincing. However, the usual empirical studies, including the two chapters of this dissertation, are based on the median voter model, which may not a best model for analyzing senatorial behavior. The third essay of this dissertation concentrated on developing a new methodology for analyzing senatorial behavior--an electoral coalition approach to principal-agent model. I showed that the new method better explained the senatorial ideological difference within a state and across states. However, campaign contributions from special interest groups and political party affiliation were the most significant variables in explaining the ideological differences.

The findings suggest that we should use electoral coalition approaches in analyzing politicians' behavior as well as other influential variables such as party and

campaign contributions from PACs. In doing so, it would be best to estimate them systematically by using a simultaneous logit or probit model.

REFERENCES

Adams, James D., and Kenny, Lawrence W. "Optimal Tenure of Elected Public Officials," Journal of Law and Economics, Vol. 29 (1986), pp. 303-328.

Adams, James D., and Kenny, Lawrence W. "The Retention of State Governors," Public Choice (forthcoming).

Barro, Robert J. "The Control of Politicians: An Economic Model," Public Choice, Vol. 14 (1973), pp. 19-42.

Becker, G. S., and Ghez, G. R. The Allocation of Time and Goods Over the Life Cycle (1975), New York: Columbia University Press.

Bennett, James T., and Mayberry, Eddie R. "Federal Tax Burdens and Grant Benefits to States: The Impact of Imperfect Representation," Public Choice, Vol. 34 (1979), pp. 255-269.

Bureau of the Census. Congressional Districts of the 98th Congress (1983), Washington, D.C.: U.S. Department of Commerce.

Bureau of the Census. County and City Data Book (1983), Washington, D.D. : U.S. Department of Commerce.

Burkhauser, R. V., and Quinn, J. F. "Is Mandatory Retirement Overrated? Evidence From 1970s," The Journal of Resources, Vol. 28 (1983), pp. 337-358.

Burkhauser, R. V., and Turner, J. A. "A Time Series Analysis on Social Security and Its Effect on the Market Work of Men at Younger Ages," Journal of Political Economy, Vol 86 (1978), pp. 701-715.

Congressional Quarterly. Congressional Quarterly Weekly Report (1978), Washington, D.C.: Congressional Quarterly, Inc.

Congressional Quarterly. Congressional Quarterly Weekly Report (1983), Washington, D.C.: Congressional Quarterly, Inc.

Congressional Quarterly. Congressional Quarterly Weekly Report (1984), Washington, D.C.: Congressional Quarterly, Inc.

Congressional Quarterly, Inc. Congressional Quarterly's Guide to Congress (1982), Washington, D.C.: Congressional Quarterly, Inc.

Diamond, P. A. and Hausman J. A. "The Retirement and Unemployment Behavior of Older Men," In Aaron and Burtless (Eds.), Retirement and Economic Behavior: Studies in Social Economics (1984), Washington, D.C.: Brookings Institution, pp. 97-134.

Dougan, William R. and Munger, Michael C. "The Rationality of Ideology," Journal of Law and Economics, (forthcoming).

Downs, Anthony. An Economic Theory of Democracy (1957), New York: Harper and Row.

Federal Election Commission, Campaign Expenditures in the United States (1977-78, 1979-80, 1981-82), Ann Arbor: ICPSR.

Ferejohn, John. "Incumbent Performance and Electoral Control," Public Choice, Vol. 50 (1986), pp. 5-25.

Fiorina, Morris P. Representatives, Roll Calls, and Constituencies (1974), Lexington, Mass: Lexington Books.

Hibbing, John R. Choosing to Leave: Voluntary Retirement from the U.S. House of Representatives (1982), Washington, D.C.: University Press of America.

Kalt, Joseph P., and Zupan, Mark A. "Capture and Ideology in the Economic Theory of Politics," American Economic Review, Vol. 74 (June 1984), pp. 365-84.

Kalt, Joseph P., and Zupan, Mark A. "The Apparent Ideological Behavior of Legislators: Testing for Principal-Agent Slack in Political Institutions," unpublished manuscript (1987).

Kau, James B., and Rubin, Paul H. "Self-Interest, Ideology, and Logrolling in Congressional Voting," Journal of Law and Economics, Vol. 22 (Oct. 1979), pp. 365-84.

Kramer, Gerald H. "A Dynamical Model of Political Equilibrium," Journal of Economic Theory, Vol. 16 (1977), pp. 310-334.

Lindsay, Cotton M. and Maloney, Michael T. "Party Politics and the Price of Payola," Economic Inquiry, Vol. 26 (1988), pp. 203-221.

Lott, John R. Jr. "Brand Names and Barriers to Entry in Political Markets," Public Choice, Vol. 51 (1986), pp. 87-92.

Lott, John R. Jr. "Political Cheating," Public Choice, Vol. 52 (1987), pp. 169-187.

Maddala, G. S. Limited-Dependant and Qualitative Variables in Econometrics (1983), Cambridge: Cambridge University Press.

Maddala, G. S. Introduction to Econometrics (1988), New York: Macmillan.

McCormick Robert E. and Tollison Robert D. Politicians, Legislation, and the Economy (1981), Boston: Martinus Nijhoff Publishing.

McKelvey, Richard D. "Policy Related Voting and Electoral Equilibrium," Econometrica, Vol. 43 (1975), pp. 815-843.

McKelvey, Richard D., and Ordeshook, Peter C. "Election with Limited Information: A Fulfilled Expectations Model Using Contemporaneous Poll and Endorsement Data as Information Sources," Journal of Economic Theory, Vol. 36 (1985), pp. 55-85.

Nelson, D., and Silberberg, E. "Ideology and Legislator Shirking," Economic Inquiry, Vol. 25 (Jan. 1987), pp. 15-25.

Netter, J. M., "Political Competition and Advertising as a Barrier to Entry," Southern Economic Journal, Vol. 50 (1983), pp. 510-20.

Peltzman, S. "Toward a More General Theory of Regulation," Journal of Law and Economics, Vol. 19 (August 1976), pp. 211-40.

Peltzman, S. "The Growth of Government," Journal of Law and Economics, Vol. 23 (Oct. 1980), pp. 209-287.

Peltzman, S. "Constituent Interest and Congressional Voting," Journal of Law and Economics, Vol. 27 (April 1984), pp. 181-210.

Posner, Richard. "Theories of Economics Regulation," Bell Journal of Economics and Management Science, Vol. 4 (1974), pp. 335-58.

Silberman, Jonathan I. and Durden, Garey C. "Determining Legislative Preferences on the Minimum Wage: An Economic Approach," Journal of Political Economics, Vol. 84 (1976), pp. 317-329.

Stigler, G. J. "The Theory of Economic Regulation," Bell Journal of Economics and Management Science, Vol. 2 (1971), pp. 3-21.

Telser, Lester G. "A Theory of Self-Enforcing Agreements," Journal of Law and Economics, Vol. 19 (1980), pp. 27-44.

Weingast, B. R. "The Congressional-Bureaucratic System: A Principal-Agent Perspective (with Applications to the SEC)," Public Choice, Vol. 44 (1984), pp. 147-191.

Marquis Who's Who. Who's Who in America (1970 through 1984), Chicago: Marquis Who's Who.

Williamson, Oliver E. "Vertical Integration and Related Variations on a Transaction-Cost Economics Theme," in Stiglitz and Mathewson (Eds), New Developments in the Analysis of Market Structure, (1986), Cambridge: MIT Press, pp. 230-247.

Zuckerman, E. Almanac of Federal PACs (1986), Washington, D.C.: Amward Publiscations, Inc.

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